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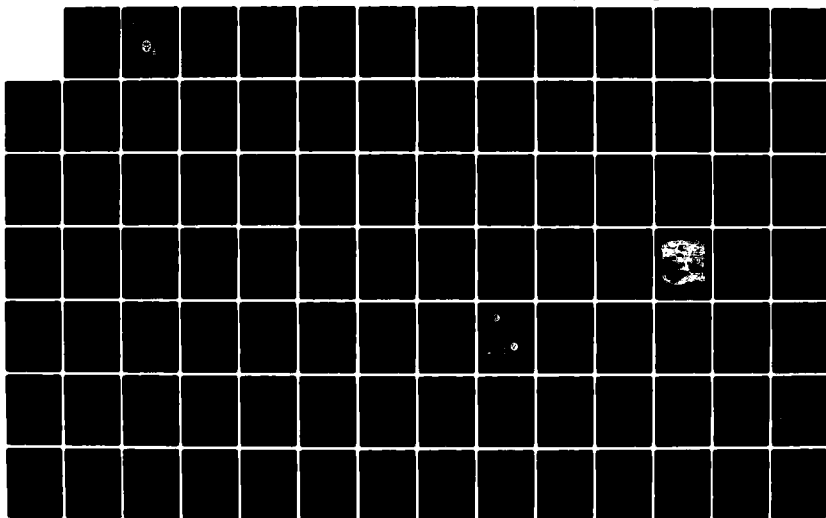
PREVENTIVE DENTISTRY CONFERENCE - PUBLIC HEALTH ASPECTS  
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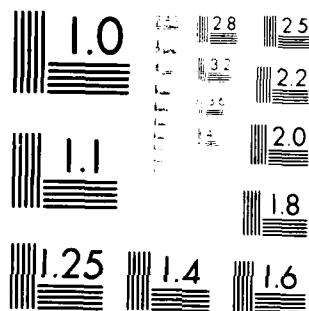
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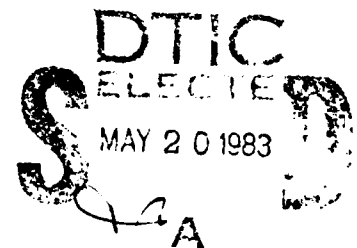


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US ARMY  
HEALTH  
SERVICES  
COMMAND

**PREVENTIVE  
DENTISTRY  
CONFERENCE**

**PUBLIC HEALTH ASPECTS  
OF  
PREVENTIVE DENTISTRY**



**3-4 MARCH 1983**

**DIRECTORATE OF DENTAL SERVICES  
Fort Sam Houston, Texas 78234**

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PROCEEDINGS OF  
1983 HSC PREVENTIVE DENTISTRY CONFERENCE

PUBLIC HEALTH ASPECTS  
OF  
PREVENTIVE DENTISTRY

Edited by  
Lieutenant Colonel John E. King

APRIL 1983

DIRECTORATE OF DENTAL SERVICES, US ARMY HEALTH SERVICES COMMAND  
FORT SAM HOUSTON, TEXAS

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This document is the printed proceedings of the 1983 US Army Health Services Command Preventive Dentistry Conference. A series of lectures illustrated the concepts of community diagnosis, community (Treatment) planning, community program operation and program evaluation. Examples of the concepts at Army installations were presented. Particular emphasis was placed on designing a preventive dentistry program to improve the dental combat readiness of deployable units. Some summary statistics were used to simulate the impact of dental emergencies on the military mission.		

The findings and opinions expressed in this report are those of the authors and are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

This document has been approved for Public Release.

A handwritten signature in cursive script, reading "Marlin R. Lewis".

MARLIN R. LEWIS  
Colonel, DC  
Directorate of Dental Services  
Health Services Command

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US Army Health Services Command  
1983 PREVENTIVE DENTISTRY CONFERENCE  
Rm 2306, Academy of Health Sciences  
Fort Sam Houston, TX

AGENDA

<u>TIME</u>	<u>TOPIC</u>	<u>SPEAKER</u>
Thursday, 3 March		
0800	Opening Remarks	COL Lewis
0815	Welcoming Address	BG Lefler
0830	Administrative Announcements	LTC King
0900	Introduction to Army Community Dentistry (ACD)	LTC King
0945	BREAK	
1000	Community Preventive Dentistry in NC - An Example	Dr. Rozier
1200	Lunch & Learn (optional)	Ms. Bowen
1330	ACD - Community Diagnosis	LTC Shulman
1445	BREAK	
1500	ACD - Program Planning	LTC King
1630	CLOSE	

EVENING

Social Event (optional)



<u>TIME</u>	<u>TOPIC</u>	<u>SPEAKER</u>
Thursday, 4 March		
0800	Administrative Announcements	LTC King
0815	History of Preventive Dentistry in the Army	COL Barnes
0900	ACD - Program Evaluation	LTC King
1000	BREAK	
1015	Dental Readiness Program at Fort Knox	Ms. Bowen
1115	Dental Readiness in a Line Unit	CSM Wolfe
1200	Lunch & Learn (optional)	Ms. Bowen
1330	Community Fluoridation in the Army	Ms. Becker
1400	New Dental Hygiene Program	COL Bowles
1430	BREAK	
1445	Panel - Army Prevention/ Public Health	LTC King Dr. Rozier COL Barnes LTC Shulman
1530	Course Evaluation	

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CPT Paul Abbey	USA DENTAC Ft Monmouth, NJ 07703
CPT Amos Acevdo	USA DENTAC Ft Polk, LA 71459
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CPT Alan Garlick	USA DENTAC Ft Lee, VA 23801
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CPT Gene Kahn	USA DENTAC Ft Belvoir, VA 22060
CPT James Kretzschmar	USA DENTAC Redstone Arsenal, AL 35809
CPT Raymond Moy	USA DENTAC Ft Irwin, CA 92310
CPT Mark Nelke	USA DENTAC Ft Dix, NJ 08640
CPT Gates Parker	USA DENTAC Ft Sheridan, IL 60037
CPT G. R. Smith	USA DENTAC Ft Eustis, VA 23604
Ms. Diane Adams	USA DENTAC Ft Riley, KS 66442

OPENING REMARKS

HSC PREVENTIVE DENTISTRY CONFERENCE

by

COLONEL MARLIN R. LEWIS

## OPENING REMARKS

### HSC PREVENTIVE DENTISTRY CONFERENCE

I am very pleased to be here today to open this biennial Preventive Dentistry Conference. Looking over names and faces we are very fortunate to have a considerable amount of expertise and experience in this group. Welcome to each and every one in attendance, in particular and probably for the first time, a layman who will give us a report on his personal experience, CSM Wolf of the 194th Armored Brigade, Fort Knox, Kentucky. We also want to welcome COL George Barnes from Fort Hood, who graciously consented to speak at this conference. COL Barnes is the PD Consultant for The Surgeon General.

Many means and methods have been utilized to bring our soldiers into the fold of prevention. Have we been successful? We all remember Phase I and Phase II program then the switch to all encompassing OHMP. The desire to instill prevention has been at the least a trying adventure. Even in countries with socialized dentistry the conversion of needs to demands to utilization is usually no greater than 50%. We find this true also in the US Army. We graduate from dental school with altruistic inclinations and dental school values. We have difficulty accepting any philosophy that does not provide complete, comprehensive dental care for everyone. We don't understand why patients won't brush or floss. Maybe much of this misunderstanding can be avoided by a more careful orientation by the Commander, the P.D. Officer/Community Oral Health Hygienist and by each specialty area when we come into the Army Dental Care System. Possibly, we can put more emphasis on P.D. during residency training programs.

However, the state of oral health of our soldiers is not an indictment against the efforts of the Army Dental Care System; it is a multisided indictment against the individual, his society, his culture and the entire profession of dentistry, military and civilian. In my opinion, prevention is not just a specialty of dentistry, but an integral part of every aspect of dentistry and it is the responsibility of Community Oral Health Managers and Preventive Dentistry Officers to supply the thread that binds these aspects together. Your challenge is to change the mind of the individual who has been told from childhood on not to waste time on dentistry as he will lose his teeth

anyway. After 7 years plus in private practice, I can honestly say the Army Dental Care System does much more in the line of prevention than the civilian sector. Is it because we have a more captive audience?

As a member of the HSC Inspector General's Team I had the opportunity to visit 32 of the 38 DENTACS and to personally view programs, as time allowed. I was impressed with the sincere dedication displayed, the quality of dedication displayed, the quality of programs--many with a concept geared toward community dental health. From what I have read and heard, this is a decided improvement from where we were over 20 years ago when we delivered the best care to only those who sought it. The remainder of the community was neglected, and we felt no responsibility for this neglect.

This conference is designed for a sharing of ideas--ideas which you can take back to your installation and be adapted to mission. If you have problem areas, or uncertainty, now is the time to address them. Determine goals and objectives, ways in which to carry them through and the yardsticks to gauge success. Our major goal is "READINESS" for the soldiers and "QUALITY OF LIFE" for the soldier's family. A class "A" or "B" soldier won't be a dental casualty when he is vitally needed, and he will be a better soldier if he knows his family is well cared for.

WELCOME ADDRESS

HSC PREVENTIVE DENTISTRY CONFERENCE

by

BRIGADIER GENERAL BILL B. LEFLER, DC  
DEPUTY COMMANDER AND DIRECTOR OF DENTAL SERVICES  
US ARMY HEALTH SERVICES COMMAND

## WELCOME ADDRESS

### HSC PREVENTIVE DENTISTRY CONFERENCE

It is a privilege for me to welcome you to San Antonio and our Preventive Dentistry Conference on behalf of Major General Bishop, the HSC Commander and Major General Chandler, the Chief of the Army Dental Corps. The purpose of this conference is to allow you to interact with each other, share ideas and gain new information so that our Preventive Dentistry Programs throughout the command will be enhanced. The philosophy of the Army Medical Department is, "Prevention of disease rather than repairing the ravages of disease." This is truly public health.

The reason we have an Army Medical Department is to make sure that we have a healthy Army, one that if called on can assist the other members of our Armed Forces in responding to aggression in the defense of our freedom. Readiness is the name of the game. The National Policy is a Volunteer Army. By making sure our Army remains healthy, the members will not become casualties as the result of disease. By providing quality health care to the family members, the quality of life will be enhanced and hopefully our soldiers will remain on active duty.

It is also our responsibility (dental personnel) to be ready to assist in a mass casualty situation, to be able to provide life saving techniques, to be able to function in a field environment. We have a Dental Care System that is responsible for meeting the dental needs of our military population. The Army Dental Corps is a very important part of the Army Medical Department and for 72 years has contributed greatly to the health of our soldiers and family members.

How do we do this?

1. A comprehensive Preventive Dentistry Program that meets the needs of our military population. Each of you are responsible for a different military population. You must know this population to meet their needs.
2. A comprehensive Continuing Education Program that meets the needs of the personnel of the Dental Care System. This includes military as well as professional and administrative subjects.
3. The dental health providers provide the maximum amount of quality care at the lowest possible cost (efficient and cost effective).
4. Develop and maintain a pure line of communication vertically and horizontally throughout the Army and the Department of Defense.



5. Develop and maintain a social atmosphere that will enhance esprit, total health and creativity. (We want our people to be happy to go to work.)

This conference will help meet the first objective. The lectures of this conference will be published and distributed as a publication to assist you as Preventive Dentistry Officers and Public Health Dental Hygienists in developing and managing your programs and advising your commanders.

I appreciate the work you all are doing. Thanks to you we do have a Preventive Philosophy. We must continue to improve and your presence here this week will do just that. I challenge you to think about where we were, where we are and plot out where we are going.

INTRODUCTION  
TO  
1983 HSC PREVENTIVE DENTISTRY CONFERENCE

by

LIEUTENANT COLONEL JOHN E. KING

INTRODUCTION  
TO  
1983 HSC PREVENTIVE DENTISTRY CONFERENCE

Preventive Dentistry Conferences in the past have emphasized many of the methods we have at our disposal to prevent dental disease and promote oral health. The periodic recurrence of the Preventive Dentistry Conference is acknowledgement of the need to renew and update our knowledge of these methods. This year's conference will emphasize the public health (community dentistry) considerations of preventive dentistry.

CONFERENCE GOALS

As a result of this conference the participant Public Health Dental Hygienist or Preventive Dentistry Officer will be able to: (1) diagnose the community which he/she serves; (2) plan a Preventive Dentistry Program for his/her community; and (3) evaluate the Preventive Dentistry Program.

Hypothetical evaluation criteria for the Conference:

(1) At the end of six months from the date of the closing of this conference the post Public Health Dental Hygienist and/or Preventive Dentistry Officer will be able to present a Preventive Dentistry Program Plan for his/her Commander to a staff assistance visitor from HSC or the HSC IG.

(2) At the end of a year from the date of the closing of this conference the post Public Health Dental Hygienist and/or Preventive Dentistry Officer will be able to present records of program operation and a periodic program evaluation for his/her Commander to a staff assistance visitor from HSC or the HSC IG.

Many of the conference attendees already have the skills to meet these goals and several of you have written, operated and evaluated a preventive dentistry program plan. I call upon those of you who have this skill and experience to contribute your guidance to others during and after this meeting so that every post will not only have preventive dentistry ACTIVITIES, but also a documented Preventive Dentistry PROGRAM.

## THE PROGRAMMING PROCESS

In everyday life we all systematically approach the solution to problems. It is almost an automatic process for most of us. Program planning for a Preventive Dentistry Program can be accomplished using the same, simple, day-to-day principles.

Consider the process of planning a vacation. Before final decision on the destination (goal) on our vacation we will probably seek some information: How much time do I have? How much money is available? What would I like to do? Is weather a factor? What means of transportation are available? Do alternative routes exist? Where will I be starting from? Only after we have assessed these and other questions will we set our goals and plan for the methods and resources. I think we would all agree that we should also keep flexible in our plan in case one or more of the factors we assessed change.

In clinical dentistry we formalize the same simple principles. We clinically assess our patient and diagnose his problem. We make a treatment plan. We carry out the plan (treat our patient). And we follow-up (evaluate) the treatment.

Community dentistry is no more complicated. You will hear each of the Public Health Dentists on this program repeat the same theme: The primary difference between other specialties and Public Health Dentistry is that the community is the patient, not the individual. Otherwise, we follow the same principles: We assess our community and diagnose its problems. We document a program plan. We carry out our plan. And if we are good practitioners we evaluate our community for the effectiveness and efficiency of our program.

You will be able to observe that the principles illustrated in the three examples above are addressed in the topics in the Conference Agenda. Other topics in the Agenda are intended to be examples of the Programming Process.

## GOAL CLARIFICATION

LTC Jay Shulman will address the topic of Community Diagnosis. However, one aspect of the community which he will not discuss will be the goals which are imposed on the preventive dentistry program by virtue of our membership in the larger organization. Preventive Dentistry Programs exist to support the stated goals of each level of the Army hierarchy.

The Secretary of the Army, John O. Marsh, Jr. and the Army Chief of Staff, General Edward C. Meyer have stated the mission all programs should support:

"The mission of the Total Army is to deter any attack upon U.S. interests and, if deterrence fails, to engage and defeat any enemy in any environment."[1]

The Secretary and the Chief of Staff define the "Total Army" as the members of the Active Army, Army National Guard, Army Reserve and Army Civilian Employees. They also state seven Total Army Goals. (See Appendix A.) All programs in the Army should have goals which are in concert with these seven.

Programs of the Army Medical Department (AMEDD) support many if not all of the Total Army Goals, however, the AMEDD mission statement is most closely aligned with the READINESS of the Army's most valuable resource, its fighting personnel.

"To maintain the health of the Army and to conserve the fighting strength."[2]

Army Surgeon General, LTG B. T. Mittermeyer further interpreted the AMEDD mission:

"The principal mission of the Army Medical Department is to assure a physically and mentally fit military force and insure a ready reservoir of competent, highly-trained health care professionals to support contingencies, mobilization, and combat operations."  
[3]

The mission of the Army Dental Corps also reflects this READINESS goal:

"To conserve the fighting strength by preventing, diagnosing and treating oral disease."[4]

It goes without need for further comment that the AMEDD contribution to the HUMAN goal is considerable. All health care for military family members support this goal. It has been my observation that most of our preventive dentistry programs are strong in activities which are intended to promote a wholesome family life.

In an address to the AMEDD Executive Management Course on 27 January 1983, BG Lefler referred the same set of Total Army Goals when he stated, "The Army Dental Corps and the Army Dental Care System must relate to all of these goals."[5]

I perceive this statement as a mandate to you and me to make our preventive dentistry goals fit within the framework of the seven Total Army Goals.

The two goals which are most relevant to preventive dentistry deserve some discussion.

#### READINESS

There are two components of dental readiness. First there is the capability of dental personnel, equipment and doctrine to support contingencies, mobilization and combat operations. Although preventive dentistry will be an important component of combat operation doctrine, it will most likely not be developed by your installation program. I will dwell no further on this aspect.

The second component of dental readiness is related to the level of health of deployable troops. Combat troops must have a level of health which will not interfere with the performance of their combat mission. Table 1 summarizes findings from several studies on combat and field dental emergency rates. Depending on the number of days lost to care for a dental emergency and the rate at which the emergencies occur, a tremendous impact on combat manpower can be predicted. This impact is in addition to maxillofacial combat injuries, routine dental procedures and preventive care.

It is of interest to us that many of the emergencies which occur in the field are related to conditions which are amenable to prevention. Many of the emergencies are caused by caries, pericoronitis, and periodontal disease. Table 2 illustrates statistics typical of studies showing close to 70 percent of the emergencies are in these three potentially preventable categories of dental conditions.

In light of the above discussion, a desirable HSC PREVENTIVE DENTISTRY READINESS GOAL might be proposed:

"To prevent dental emergencies among troops who are likely to deploy to a theater of operations."

It is obvious that a preventive dentistry program with this stated goal must incorporate methods of secondary and tertiary prevention as well as primary prevention. (See Appendix B.) My perception is that many installation preventive dentistry programs have viewed primary prevention as the principal goal of their activities. Secondary and tertiary prevention has been left entirely to clinical programs. We will see in later lectures that

present clinical programs are probably not able to treat the part of the community with the greatest potential for combat dental emergencies without a public health program. Unfortunately the Army Oral Health Maintenance Program, with its great potential to be the public health interface between prevention of dental emergencies and clinical treatment, is viewed by many line personnel as well as some dental personnel to be just an annual administrative requirement, not an instrument of readiness.

The public health program implemented to improve the dental readiness of deployable troops should incorporate methods to identify individuals who have potential for dental emergencies, insure priority for treatment of the risk producing conditions, and allow line commanders and NCOs to monitor the dental readiness status of their units.

Proposals for accomplishing this type of program are forthcoming in this conference.

It is by design that I initiated the discussion with the READINESS goal; Not because the HUMAN goal is less important, but because it is more obvious to those of us who have adopted careers in the health professions. The Army acknowledges that people are its most important resource and so are entitled to services which promote his/her and family members' wellness. Oral health promotion are an integral part of wellness.

An HSC PREVENTIVE DENTISTRY HUMAN GOAL is proposed:

"To promote the oral health (wellness) of all service members, their families, and other eligible beneficiaries."

Certainly clinical programs provide services which further both goals, however, I would like to emphasize the "community" nature of your assignment as Public Health Dental Hygienist or Preventive Dentistry Officer. Without a community program, dental clinics will access only a portion of the population. Figures 1 and 2 illustrate a simplified civilian model for dental care delivery. Calling attention to the fact that although a community may have many dental needs civilian dental care providers generally can only treat those individuals which demand services. The only mechanism available to the private practitioner for decreasing the needs of his community is to devise a way to increase demand. (See Figure 3.) The military model should be able to identify that portion of the need which is not ordinarily demanded by the individual, but which poses high risk for interference with the military mission (mission essential needs). (See Figure 4.) The program developed should then target that portion of the community for secondary and tertiary preventive measures.

Goal clarification is a vital step in the process of programming.

" . . . if one knows where he is going, he finds it easier to get there, he can get there faster, and he will know it when he arrives." [6]



#### ENDNOTES

[1] Marsh, J. O. and Meyer, E. C., Letter Dated 7 Dec 1981,  
Subject: Total Army Goals, Washington, DC.

[2] Army Regulation 40-1.

[3] Mittemeyer, B. T., Federal Medical Chiefs on Progress  
and Plans, Army Medical Department, Milit. Med. 147:918,  
Nov 1982.

[4] Army Regulation 10-2.

[5] Lefler, B. B., Address to AMEDD Executive Management  
Course, Academy of Health Sciences, Fort Sam Houston, Texas,  
27 Jan 1983.

[6] Brady, R. H., MBO goes to work in the public sector,  
Harvard Business Review, p. 66, Mar - Apr 1973.

TABLES AND FIGURES

TABLE 1

## DENTAL EMERGENCY RATES in a THEATER of OPERATIONS

Division				
	Incidence	Strength	Days	Man Days
	Rate*	(x1000)	Lost	Lost/Div
WORST CASE	234	X 16	X 5	= 18,720
AVERAGE CASE	188	X 16	X 3	= 9,024
BEST CASE	142	X 16	X 1	= 2,272

\* Incidence rate is expressed as \_\_\_\_\_ per 1000 troops per year.

TABLE 2  
**RELATIVE FREQUENCY(%) OF CATEGORIES OF DENTAL  
 EMERGENCIES AMONG NAVY-MARINE PERSONNEL  
 IN VIETNAM AND CONUS, 1970.\***

<b>CATEGORY</b>	<b>VIETNAM</b>	<b>CONUS</b>
<b>CARIES</b>	<b>48.8%</b>	<b>46.0%</b>
<b>PERICORONITIS</b>	<b>18.3</b>	<b>14.0</b>
<b>PERIODONTAL</b>	<b>9.2</b>	<b>11.0</b>
<b>TRAUMATIC</b>	<b>7.6</b>	<b>6.0</b>
<b>PROSTHETIC</b>	<b>3.1</b>	<b>8.5</b>
<b>OTHER</b>	<b>13.0</b>	<b>14.5</b>

**\*ADAPTED FROM LUDWICK, W.E. ET AL., DENTAL EMERGENCIES  
 OCCURING AMONG NAVY-MARINE PERSONNEL SERVING  
 IN VIETNAM. MILIT. MED. pp 121-23, FEB 1974.**

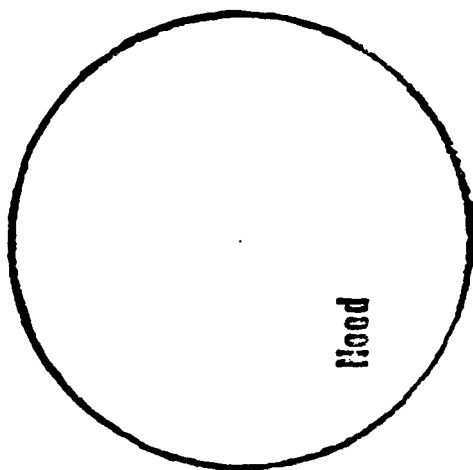


figure 1 NEED VS DEMAND MODEL

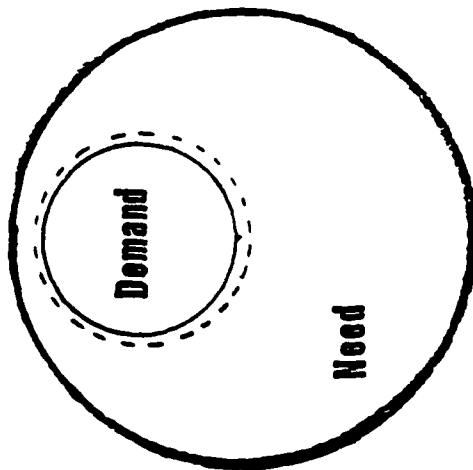


figure 3 NEED VS DEMAND MODEL

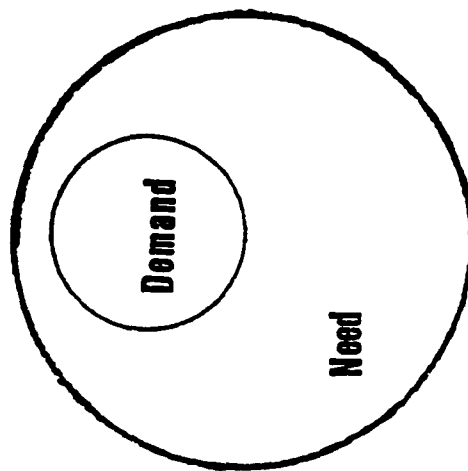
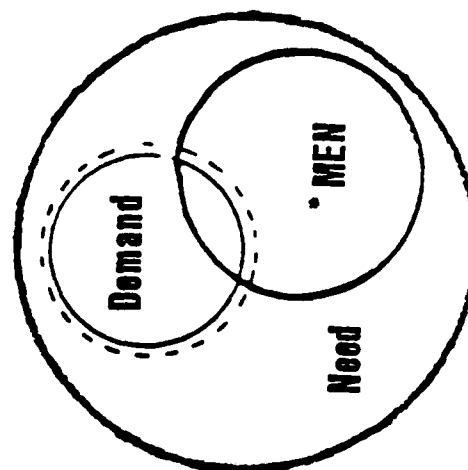


figure 2 CIVILIAN MODEL  
NEED VS DEMAND MODEL



MILITARY MODEL  
figure 4 NEED VS DEMAND MODEL

APPENDIX A

TOTAL ARMY GOALS

## TOTAL ARMY GOALS

### READINESS

A Total Army prepared for the "three days of war"; to deter the day before war; to fight and win on the day of war; and to terminate conflict in such a manner that on the day after war, the United States and its allies have an acceptable level of security.

Readiness reflects the capability of the Total Army, as perceived by its members, allies, and potential foes, to respond successfully to the full spectrum of warfare — from terrorism to nuclear conflict. Training, maintenance, leadership, resource management, and close coordination with the other Services and allies are the essential elements of readiness.

### HUMAN

A Total Army composed of military and civilian professionals who loyally serve their nation in rewarding careers.

Attracting and retaining high quality Total Army members are essential to insure that service in the Army remains a way of life. This commitment to a profession is accomplished by striving to provide all members meaningful and satisfying duty, adequate living and working facilities, equitable compensation, professional development, advancement opportunity, and wholesome family life.

### LEADERSHIP

A Total Army whose leaders at all levels possess the highest ethical and professional standards committed to mission accomplishment and the well-being of subordinates.

Competent, effective leadership is the Total Army's key to success in training and success in the ultimate test — combat.

### MATERIEL

A Total Army equipped and sustained to win any land battle. The Total Army requires a technically superior, reliable, and powerful arsenal of effective weapons and equipment which can be rapidly transported, simply operated and easily maintained. Weapons and equipment must be developed through a cost-disciplined acquisition process that places a total system in the hands of trained personnel in the shortest possible time. Resupply procedures must be complete and sufficient for sustaining extended combat. Logistical support procedures must exist between the United States and its allies.

### FUTURE DEVELOPMENT

A Total Army sensitive to innovative approaches to accomplish its mission. Responding to the full spectrum of warfare demands innovative approaches to doctrine, force structure, manning, training, and mobilizing along with a commitment toward adopting those technological advances which promise full return on investment.

### STRATEGIC DEPLOYMENT

A Total Army organized, manned, and equipped so as to be capable of deploying, with transportation assistance, to any part of the globe to counter a wide spectrum of threats.

The global interests of the United States require a capability for global response. This entails support for the other Services in achieving the necessary transportation assets and developing innovative approaches to overcoming transportation shortages.

### MANAGEMENT

A Total Army which efficiently and effectively uses the resources made available. Management is the science of achieving maximum productivity from resources -- manpower, money, materiel, and time through appropriate management systems and techniques.



APPENDIX B

LEVELS OF PREVENTION

## **LEVELS OF PREVENTION**

**Primary Prevention - health promotion and specific protection during the prepathogenic period.**

**Secondary Prevention - early diagnosis and prompt treatment early in the period of pathogenesis.**

**Tertiary Prevention - disability limitation and rehabilitation during a later period of pathogenesis.**

COMMUNITY PREVENTIVE DENTISTRY IN  
NORTH CAROLINA - AN EXAMPLE

by

Doctor R. Gary Rozier

## THE NORTH CAROLINA PREVENTIVE DENTISTRY PROGRAM:

### A CASE STUDY IN PLANNING AND EVALUATION

by R. Gary Rozier, D.D.S.

#### Introduction

The development of the statewide Preventive Dentistry Program in North Carolina has been a steady, evolutionary process.<sup>1-5</sup> Today's program is a comprehensive one utilizing the latest techniques for the prevention and control of oral diseases. It is significant that the program was initiated by the North Carolina Dental Society, representing private practitioners; is administered by the Dental Health Section of the Department of Human Resources; and is supported strongly by the University of North Carolina School of Dentistry, in cooperation with many other agencies--The Department of Public Instruction, community colleges, the University of North Carolina School of Public Health, the North Carolina Dental Hygienists Association, the North Carolina Dental Assistants Association, the Agricultural Extension Service and other consumer and civic organizations.

Effective community health programs must be based on sound principles of program planning. While there are many approaches to planning, each in essence involves a conscious effort to affect future events for the purposes of resolving problems. The purpose of this paper is to present the development and implementation of the North Carolina Preventive Dentistry Program to illustrate the program planning process as applied in one state.

Planning can occur at different levels within an organization. The North Carolina Dental program has three administrative tiers--state, regional, and local. The planning process as presented in this paper will focus on statewide planning activities and on health outcome goal definition and evaluation.

#### A Program Planning Framework

Program planning experience in health has led to the identification of a series of systematic stages in the planning process.<sup>6</sup> These stages represent a logical and systematic way of thinking rationally about what is being done and achieved in carrying out programs. To a considerable extent these stages parallel the commonly accepted stages in other decision-making processes.<sup>7</sup> For example, the decision-making steps involved in patient care, biomedical research and policy formulation have all been compared to community health planning. The generic activities common to all these processes are as follows: (1) problems and related issues are identified; (2) possible solutions are generated; (3) a decision is made and an action taken; and (4) feedback is received.

In the health planning process these generic steps are translated into: (1) problem definition, (2) a statement of objectives and a consideration and selection of alternative methods of achieving these objectives;

(3) program implementation; and (4) problem solution. According to this outline, implementation is viewed as an important and integral part of the planning process. The planning document itself consists of four major areas: (1) a problem statement; (2) a statement of program goals/objectives; (3) a listing of methods for achieving these objectives; and (4) evaluation. While each of these major stages can be divided into a number of steps, this presentation will concentrate primarily on the four major stages.

### North Carolina and Its People

North Carolina is 28th in size among all the states and is 4th in size among the Southern states. It covers approximately 52,586 square miles. The greatest distances are east-west (503 miles) being almost 3 times the greatest, north-south distance (187 miles). The east-west topography of the state varies considerably. The Coastal Plain includes about 45% of the area of the state with elevations from sea level to 500 feet above sea level. Natural fluorides of up to 6 ppm exist in private wells of this area of the state.<sup>3</sup> The Piedmont lies between the Coastal Plain and Mountain zones. It also occupies about 45% of the area of the state. Elevations range from 300 to 600 feet above sea level in the east to about 1,500 feet in the west. The mountain zone, includes about 12% of the area of the state, but contains the highest elevations and most rugged topography in the Appalachian Mountain system.

North Carolina is a rural state with approximately 55% of the 1980 estimated population of 5.9 million being rural. Nationally, about 20% is nonmetropolitan. Approximately 75% of the population is white; 32% less than 21 years of age; and 10% 65 years of age and older. The median age is 29.6 years. The per capita personal income is \$7,382, about \$1,700 below the national average.<sup>9</sup>

In 1977, there was one active dentist for every 2,914 persons; .52 hygienists per active dentist.<sup>10</sup> Nationally, there is 1 active general practitioner for every 2,190 persons.<sup>11</sup>

### Some Background of the State Dental Program

North Carolina has the oldest state dental program in the nation. In 1917, dentists were concerned with the poor dental health of North Carolina children. A statewide dental program was envisioned and steps taken to establish a dental health program. The state Dental Public Health Program began in 1918 in elementary schools of the state. Local communities raised funds to retain dentists employed by the State Board of Health. These dentists provided treatment services in the schools using portable equipment. Very little primary prevention was possible because of limited staff and knowledge of prevention at the time.

### Early Preventive Activities in North Carolina: 1965-73

Several activities occurred in the state which set the stage for the Preventive Dentistry Program. These activities were a part of the preventive dentistry movement which developed in North Carolina and the nation in the 1960s. North Carolina had actively pursued fluoridation since the 1940s when in 1949 Charlotte became the first city in North Carolina and the largest metropolitan area in the nation at that time to fluoridate. The 1968 House of Delegates of the North Carolina Dental Society added its support to the fluoridation of public water supplies and to any other measures which were appropriate in delivering a sound preventive dental health program to the citizens of North Carolina. In 1969 the North Carolina Citizens Committee for Dental Health was established and successfully lobbied for funds from the legislature. The General Assembly appropriated \$45,000 to match local funds for purchasing fluoridation equipment. With these funds, several communities were given assistance in fluoridating their water supplies. By 1970 seven school fluoridators had been installed in rural schools and were under the surveillance and maintenance of the Dental Health Section.

### Initiation of the Preventive Dentistry Program

The North Carolina Preventive Program had its inception in May, 1970, at the Annual Meeting of the North Carolina Dental Society. The Dental Society passed eight resolutions advocating a statewide preventive program. The resolutions called for a reinforcement of support, cooperation and liaison with the Dental Health Section. They called for a strong program embracing school and community water fluoridation, fluoride treatments for school children, and research in plaque control for school children.

The newly installed president appointed a Task Force for Community Preventive Dental Health Education. (This committee was given standing status and had its name changed to the Preventive Dentistry Committee in 1972.) The Committee was composed of representatives from the Dental Health Section, Dental Society, community colleges training dental auxiliaries, and the University of North Carolina School of Dentistry. The purpose of this Task Force was to develop a statewide preventive dentistry program. It was to consider all possible approaches for providing the best program for the citizens of North Carolina--whether it involved utilizing professional dental offices, dental training facilities, facilities and services of public health dentistry, or public schools and community resources.

### Parallel Dental Health Section Activities

In establishing the Preventive Dentistry Program the Task Force decided to concentrate on fluoridation--both community and school water fluoridation, as well as self-application--and dental health education in the schools. The Dental Health Section with its long history of public health service in North Carolina was the logical choice to administer a

program of this type. In 1971 there were 21 dentists employed by the Section. They functioned primarily in the public schools (K-6) with a strong emphasis on education and prevention.

The preventive movement continued to develop. In 1971 a core faculty were trained in plaque control methods by the Preventive Dentistry Committee. In 1972-73 these individuals held six workshops across the state to teach preventive techniques to North Carolina dentists and dental auxiliaries. In 1972 the first two hygienists were employed by the Dental Health Section to coordinate preventive programs at the local level. The first countywide fluoridation program was initiated. The first preventive dentistry workshops for public school teachers were conducted. The section staff added plaque control techniques to their classroom programs. A fluoride mouthrinse program was started. By the end of 1972, the number of school fluoridators had increased to seventeen.

#### Ten-Year Plan Launched

As the 1973 Legislative Session approached a consultant--Dr. Frank Law--was employed to document the dental needs in North Carolina and to devise a plan to deal with these problems. His report, commonly referred to as the Ten-Year Plan, became the factual documentation for North Carolina's Preventive Dentistry Program.<sup>12</sup>

Armed with this documentation of need and a plan to deal with it, as well as the growing support among professionals, lay groups, and individuals, the Preventive Dentistry Committee approached the Legislature. In the spring of 1973, the General Assembly appropriated funds (\$261,000.00) which allowed an expansion of the Dental Health Section's preventive programs and were the official beginning of North Carolina's statewide Preventive Dentistry Program. Expansion funds have been provided in the 1975 and 1977 Legislative sessions.

#### Program Philosophy

The Preventive Dentistry Program is based on seven major premises:

1. Primary prevention including oral health promotion and disease prevention is the cornerstone of the program.
2. The program is based on sound principles of program planning and management, including an oral health needs determination, establishment of outcome goals, monitoring of process activities leading to achievement of these goals, and outcome evaluation. While the process is structured, implementation at local levels varies depending on situational needs.
3. The effectiveness of preventive methods used must be well documented by research. Some components of the program must be tested locally to determine their community effectiveness. Results of research or

demonstration projects must be evaluated by the Dental Health Section's Research and Evaluation Committee before the methods tested are used in the program.

4. The program maintains a strong commitment to continuing education to aid in information transfer of state-of-the-art preventive techniques.
5. A corollary to the above premise is that program management and staff must be flexible in order to discard or modify practices as more effective techniques become available or as monitoring/evaluation information indicates such.
6. The patient consists of all residents of the state and the public dental health program is a part of the total dental health delivery system as provided by private and public dental professionals. Treatment services (primary care) should be provided by the private sector. In areas where private providers are not accessible or available, the state assists local communities in initiating programs to provide dental services. Primary prevention, however, is the major focus of the state program.
7. All agencies and groups concerned actively with dental health will work cooperatively to achieve program goals.

#### Planning the Preventive Dentistry Program

The development of the North Carolina Preventive Dentistry Program will be presented according to the planning framework described above. It should be pointed out that program planning and evaluation in real-life is a dynamic process. The process rarely consists of the sequential completion of the several stages in the process, but involves simultaneous and continuous attention to many of the planning areas. For this reason the planning process is often presented schematically as a circular, rather than a stepwise process. The development and evaluation of the North Carolina program is no exception.

#### Problem(s): Oral Health Status

The planning and delivery of appropriate dental public health services must be based on accurate dental health data for residents of the particular geographic or political planning jurisdiction. Epidemiological data on which to identify, quantify and prioritize oral problems were available from a population-based, household survey completed during 1960-63.<sup>13</sup> The specific purpose of the survey was to record the prevalence of dental caries, periodontal disease, and to some extent treatment services as they existed in a cross section of the North Carolina population in 1960-63 and to describe their variation according to several sociodemographic variables. Approximately 7,200 individuals in 2,103 sample households were interviewed and examined. The household response rate was 96 percent. The validity



of the sample was supported by a comparison of the distribution of selected demographic and socioeconomic variables from the samples with North Carolina Census data.

Twenty-nine dentists collected all demographic and social data and used standard epidemiologic indicators of dental caries (dft and DMFT Indices),<sup>14,15</sup> periodontal disease (PI),<sup>16</sup> and oral cleanliness (OHI-S Index)<sup>17</sup> to perform an intraoral examination. The interviews and examinations were conducted in the homes of all individuals who resided in selected households and agreed to participate.

The DMF Tooth Index is the most common index used to measure caries experience. The Index for an individual is the sum of the number of teeth found to be decayed, missing, or filled at the time of the examination. The purpose of the DMFT Index is to provide an indication of an individual's lifetime experience with dental caries. Once a tooth is decayed, that tooth can only present with one of three components of the DMFT Index: the tooth can either remain decayed, be filled, or be extracted and thus be missing at the time of the examination. In adults, the interpretation of the Index becomes more complicated since the "M" component may be measuring the results of periodontal disease as well as dental caries. Possible values for an individual's or group's DMFT scores range from 0 to 32.

The Periodontal Index (PI) provides a quantitative value of the prevalence and severity of periodontal disease. The periodontal tissues surrounding each tooth are scored as: normal = 0; mild gingivitis = 1; gingivitis = 2; periodontitis = 6; or severe periodontitis = 8. These tooth values are averaged to obtain a mouth score, or PI score. The index varies from 0 to 8 in order of increasing severity. Individuals or teeth can be classified as having no disease, gingivitis only, or periodontitis.

The results indicated that nearly everyone in the state had dental disease at some point in their life. Dental decay alone attacked almost 95% of North Carolinians. The staggering dimensions of the dental disease burden in North Carolina was emphasized by the fact that there were over 12 million decayed and untreated permanent teeth in the state. Ten-year-old children had approximately 150,000 decayed but unfilled permanent teeth. For the age group, 6-11 years there was on the average 1.7 decayed, missing or filled permanent teeth with 71% of teeth ever diseased needing treatment. In the age group 12-17, an average of 6.9 teeth per person were affected with 61% of teeth ever diseased needing treatment. The corresponding national figures were 43% and 39%.

The prevalence of gingivitis and periodontitis was low in 5-19 year olds. Periodontal disease becomes more prevalent with age and accounted for the greater loss of teeth than dental decay in the older age groups.

Eleven percent of the total population--670,000 people--had lost all their teeth. Over 3,000 of these were between 15 and 19 years of age. Figure 1 shows the average number of DMF teeth and components by age for white males 5 years of age and older. The proportion of DMF teeth that

is the missing component illustrates the magnitude of the tooth loss problem in the state. By 40-49 years of age, over half the DMF teeth were missing and the number of missing teeth represented an increasing proportion of the total number of DMF teeth with age. By 50-59, over 80% of DMF teeth were missing.

Due to their high prevalence and to their health, economic and social consequences, dental decay and periodontal disease were identified as the primary targets of the preventive program.

#### Program Health Outcome Goals

The purpose of the North Carolina Preventive Dentistry Program is to help North Carolinians maintain their teeth for a lifetime. This long-range goal requires a major reduction in the prevalence of dental decay and periodontal disease. An examination of the prevalence of oral diseases and available prevention methods suggested that reasonable and attainable 10-year outcome goals for the Preventive Dentistry Program were as follows:

- A 25% reduction in dental caries in the population 20 years of age and under; and
- A 40% reduction in dental caries in the population 10 years of age and under.

As the program and recipients mature, these benefits would extend into age groups older than the targeted children and adolescents.

#### Methods: Preventive and Educational

The methods selected for achieving the goals involved a multifaceted approach of prevention and educational services. Six different components of the program were identified:

##### 1. Systemic and Topical Fluorides

This method was to receive priority because of its documented cost-effectiveness, practicality and safety. Exposure to fluoride therapy was to be extended to all school-age children in the state. Priority was to be given to community fluoridation because: It requires no compliance on the part of the public; benefits are immediate and last a lifetime; it is cost-effective, costing only about 20¢ per person per year to prevent a surface of decay; and it results in 50-65% fewer cavities.<sup>18-21</sup>

Since North Carolina is a rural state, about one half the population drinks water from private wells and thus cannot experience the benefits of community water fluoridation. Fluoridation of school water systems at 4.5 times the optimum fluoride concentration for community fluoridation in that geographic area results in caries reductions of 47%.<sup>22-24</sup> This method was chosen to reach select children in rural areas with systemic fluorides.

Finally, school children who cannot receive systemic fluorides were to participate in school topical fluoride mouthrinse programs. Dental caries reductions of 30 to 40 percent are to be expected from this regimen.<sup>25</sup> However, in the longest running community trial evaluating the effectiveness of fluoride mouthrinse, DMFT reductions of 54% in children in grades K-6 were observed after 6 years.<sup>26</sup>

## 2. School Dental Health Education

An instructional package on dental health for use in schools was to be developed. Through pre-service and in-service training programs, teachers were to be taught the information in this package and how to use it in the classroom.

## 3. Continuing Education for Dentists and Dental Auxiliaries

Recent preventive technological advances were to be transferred to private-practicing dentists within the state. As new information and techniques became available, they were also to be passed on to the profession.

## 4. Dental Health Education for Consumer Groups

Workshops for non-dental professionals and for state and regional leaders of various consumer groups such as the Agricultural Extension Service, were to be conducted to teach these opinion readers the preventive dental health methods being presented in the schools. They, in turn, would carry the information to their local units, thus providing home back-up for the school instruction in preventive methods.

## 5. Mass Media Education

Carefully programmed information on the means of achieving good dental health was to be disseminated to the public through the various communications media. Television, radio, and the press were to be employed as the vehicles.

## 6. Research and Evaluation

The impact of the preventive Dentistry Program on the dental health of the citizens of North Carolina was to be evaluated using a survey approach. According to this evaluation design, a oral health survey would be conducted of a sample representative of the total North Carolina population near the beginning of the program for comparison with similarly obtained data after ten years to determine the impact of the program on dental disease.

## Program Implementation

The Ten-Year Plan called for the employment and placement of a public health dental hygienists in each of North Carolina's 100 counties by 1983. The hygienists were to be responsible for implementing the preventive program in each county. Their role would involve the following: conducting educational and preventive programs; screening and referral of children with dental problems to private practitioners for care and treatment; supervision

of topical fluoride regimens; and assisting in the promotion of communal and school water fluoridation.

At the beginning of 1983 there were 47 dental public health professionals (18 dentists and 29 dental hygienists) providing these educational and preventive services in 63 counties. Expansion of the program according to the schedule of the Ten-Year Plan has lagged due to the lack of expansion funds since 1977.

Today, 114 water systems, serving 183 communities, are adjusting the fluoride content of their water supplies to the optimum level of 1 part per million. Twenty-six towns are served by naturally fluoridated water. A total population of 2,834,508 is now served by fluoridated water. Only two communities over 10,000 are not fluoridating.

North Carolina has one of the largest networks of school fluoridators in the world. About 50,000 rural school children are being provided fluoridated water in 131 schools in 35 counties.

The weekly fluoride mouthrinse program continues to grow. Today, there are over 383,000 children, grades K-6, in the 1,013 schools in 85 counties participating. This represents 65% of the average daily attendance in grades K-6.

Preventive educational services were provided for 296,988 children and adults in 1982. Emphasis continues to be placed on in-service training in preventive dental health for classroom teachers. Approximately 6,200 teachers have been trained. A curriculum for teaching dental health (FRAMEWORK) has been developed and will be available for use in Preschool-Grade 6 at the beginning of the 1983-83 school term.<sup>27</sup>

#### Evaluation (Redefinition of the Problem?)

Baseline epidemiological data for the Preventive Dentistry Program were collected in 1976-77.<sup>28</sup> This effort was essentially a replication of the earlier statewide, epidemiological survey reported in 1965 by Fulton and Hughes. The findings and implications of the 1976-77 survey serve as an example of the dynamic nature of program planning. The purpose of the 1976-77 survey was to update the 1960-63 data on which the preventive dentistry plan was based. The results of the most recent survey indicated that the magnitude of dental disease in the North Carolina population is changing. Thus while serving as a baseline for the Preventive Dentistry Program, the 1976-77 survey provided new insights into disease problems on which to redefine the problem. In this sense the data not only documented the need, but served as a point-in-time evaluation of oral health status changes (not necessary a result of the initial Preventive Dentistry Program activities) on which to suggest modifications in the program. This 1976-77 survey included a sample of approximately 1,450 households with examinations in 94 percent of the households yielding a sample of 3,500 individuals.

During the 15 years between the two studies there occurred a reduction in the prevalence of dental decay in children and adolescents and an increase in treatment. For the population 5 to 19 years of age the occurrence of dental decay was 13 percent lower in 1976-77 compared to 1960-63 and there were 37 percent fewer untreated cavities. In 1976, 31 percent of elementary and high school children showed no evidence of ever having experienced dental decay in permanent teeth; 82 percent reached high school graduation age without the loss of a permanent tooth; and few reached this age having lost all their teeth. As noted previously, in the early 60s close to 3,000 reached high school graduation age having lost all their permanent teeth.

Although measured conservatively, two out of four whites and three out of four non-whites 5 years of age and older were affected by periodontal disease in 1976. This means that approximately 2 million North Carolinians had periodontal disease. Some population subgroups were severely affected. For example, by age 35, 50 percent of non-white males had obvious periodontal pockets. The trends in periodontal disease are disturbing. The prevalence is increasing in children of all races and non-white adults. The prevalence in adult non-white males and females has more than doubled in 15 years. This represents increases in both mild and severe forms of the disease. The percentage of teeth affected by periodontitis at the two survey points for age groups 5-9 and older for non-white males is displayed in Figure 2. At each age grouping beginning at 30-34 years substantial increases have occurred in the percentage of teeth affected by the most obvious and reliably measured stage of periodontal disease.

The health, social, and economic consequences of periodontal disease are great. It is estimated that approximately 732,000 North Carolinians required periodontal treatment by a general dentist or periodontist in 1976. It is also estimated that approximately 500,000 hours of dentists' time would be required to meet this need. Despite these substantial treatment needs, practice-based studies among general dentists revealed that they spent only about 1 percent of their clinical practice time providing periodontal care. Therefore, only 97,000 hours of periodontal care were being provided.<sup>10</sup>

Tooth mortality continues to be a serious dental disease outcome for adults in the state. Periodontal disease contributes significantly to this tooth loss. Overall, 40 to 50 percent of teeth are lost because of periodontal disease.<sup>29</sup> The relative importance of tooth loss varies by age. For one group of North Carolinians 40-69 years of age, more than 60 percent of teeth were lost due to periodontal disease. For those aged 55 or older, the figure was as high as 80 percent.<sup>30</sup>

The reductions in caries incidence and expected reductions in tooth mortality have not carried over to middle-aged and older adults. About 26 percent of the population 30 years of age and older was edentulous in both arches in 1976-77. An additional 10 percent had no teeth in one arch. This means that 930,000 were edentulous in one or both arches.

### Emerging Priorities in the Preventive Dentistry Program

Dental health priorities, goals of the Preventive Dentistry Program, and preventive and education methods used to achieve these goals have all been reexamined in light of the 1976-77 survey results. Results of the two surveys have been valuable for rationalizing a broad-based intervention directed at controlling periodontal disease. Periodontal disease has the characteristics of a classical public health problem. The disease is widespread and has serious economic, social and health consequences. While knowledge exists about how to prevent, control or alleviate the disease, the knowledge is not being used by individuals, or by professionals in the public or private sectors.

The following outcome goal has been added to the goals already stated which related to dental caries reductions:

- To achieve at 15% reduction in periodontal disease in the population 20 years of age and under in 10 years.

A number of activities related to achieving this goal have been initiated. Presentations, workshops and/or table clinics emphasizing the increasing prevalence of periodontal disease in children and adult population subgroups have been organized for various meetings across the state.

Continuing education for practicing dentists and auxiliaries has received high priority. Faculty from the University of North Carolina (UNC) School of Dentistry presented five continuing education programs for general dentists and their staff in locations across the state. Workshops were directed toward increasing dentists' abilities in early recognition, diagnosis, treatment and/or referral of patients with periodontal disease.<sup>31,32</sup> Regional workshops were conducted for dental members of all local boards of health to explore ways to strengthen their advocacy positions for improving dental health, particularly periodontal disease. In 1981 for the first time, the Board of Dental Examiners tested for clinical competence in periodontal disease diagnosis and treatment on the state licensure examination.

Other activities in public health promotion and disease prevention have been initiated. The Dental Health Section has placed more emphasis on periodontal disease in its educational programs. For example, the Framework for Dental Health that identifies incremental educational goals, objectives and strategies for grades K-6 has been revised to include material on periodontal disease. The Section also is evaluating educational programs in grades beyond elementary school.

In January 1982 the Dental Foundation of North Carolina gave focus to these diverse activities through a grant to examine the issues involved in controlling periodontal disease in the state, to determine the feasibility of addressing the problem, and if practical, to propose comprehensive strategies for improving the situation. This planning effort involves the

Dental Health Section, the UNC Schools of Dentistry and Public Health, the UNC Health Services Research Center, the North Carolina Dental Society and other organizations. The study is advised by a committee of 23 members representing dentistry, public health, medicine, health education, nutrition, and the public. The project staff and advisory committee have proposed three approaches to the problem: (1) health promotion and disease prevention directed at the public; (2) continuing education directed at the dental profession—primarily the clinical practice of dentistry; and (3) a combination of the two. This project is continuing.

While reevaluating program directions the Dental Health Section and advisory groups continue to be committed to expanding fluoride therapies into unserved and underserved geographical areas. The Section also continues to be committed to testing new dental caries preventive techniques for use in public health settings and to adopting those that prove to be safe and cost-effective. In one demonstration project, very favorable results have been obtained in the use of sealants.<sup>33</sup> Three other pilot sealant studies are planned for 1983.

Planning for the oral health of the state population is an ongoing process that can result in improved dental health only when based on sound principles of program planning and evaluation. Planners, administrators and policy-makers must keep an eye toward health outcomes of their day-to-day activities in order to plan appropriate preventive services.

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FIGURE 1

AVERAGE DMF AND DMF COMPONENTS  
NORTH CAROLINA, 1960-1963

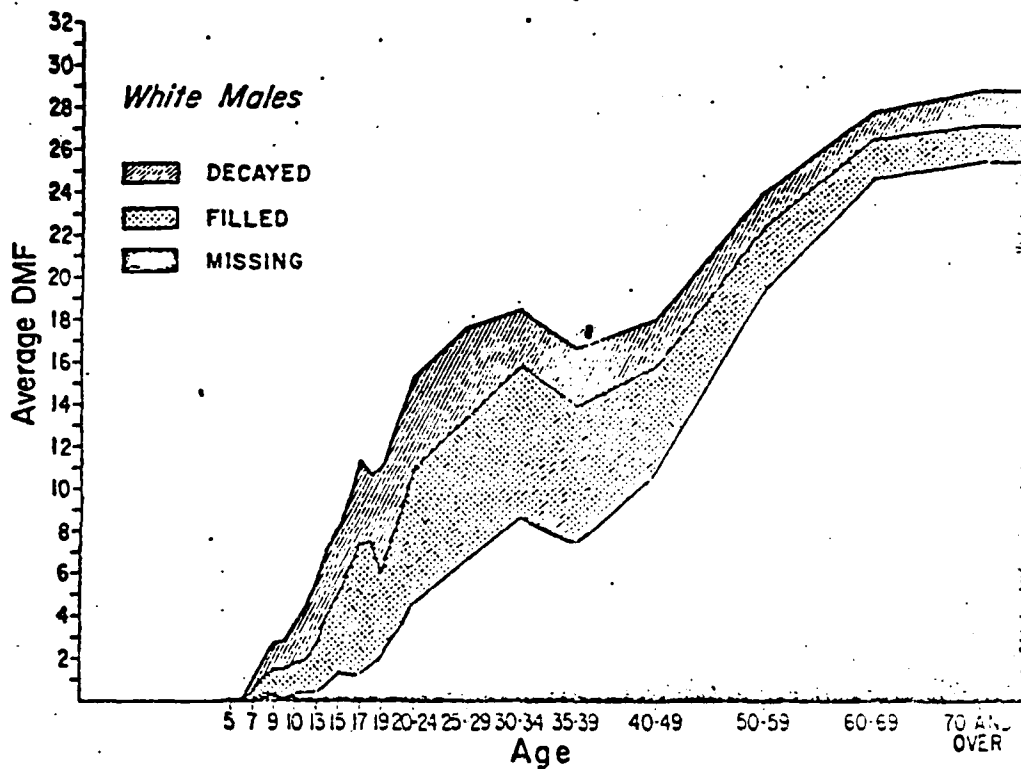
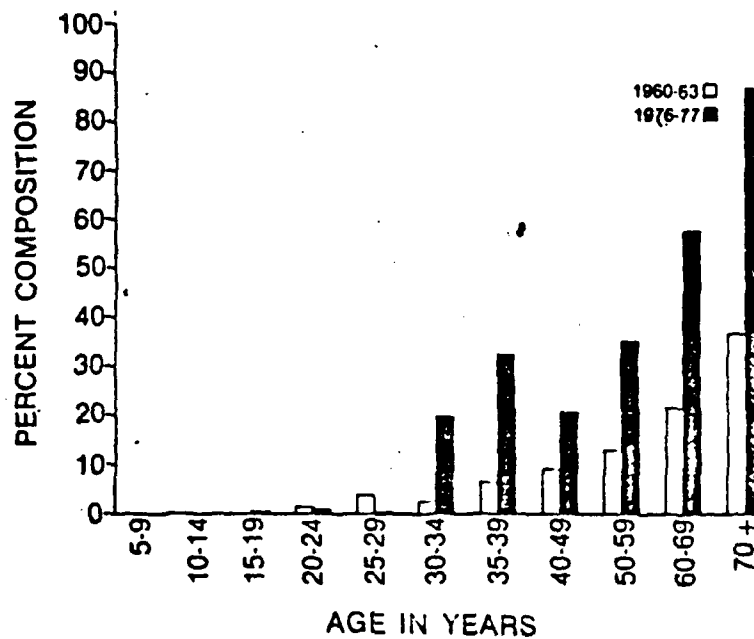


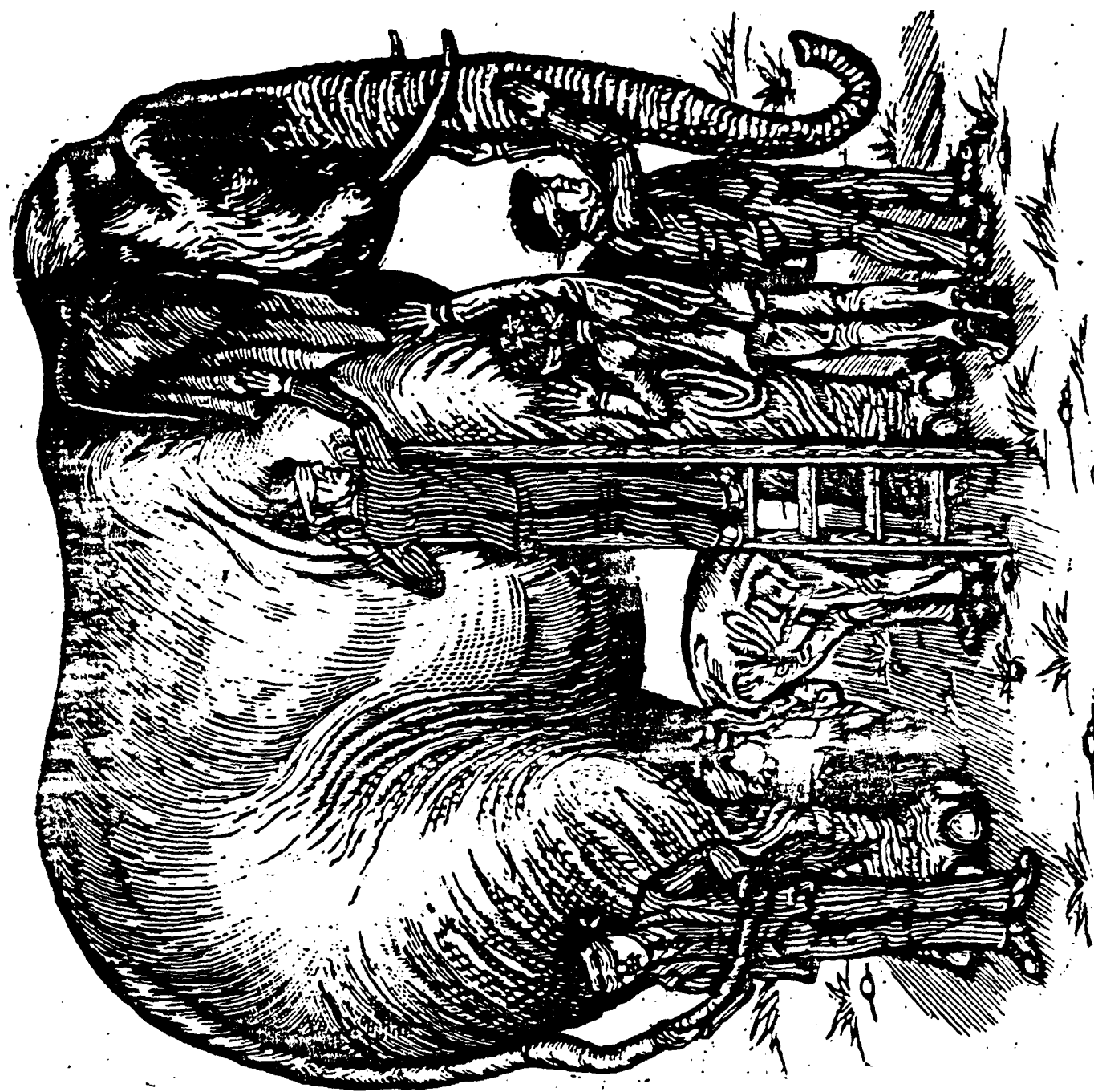
Figure 2: Percentage of at-risk teeth with periodontitis for nonwhite males, by grouped ages, North Carolina, 1960-63 and 1976-77



ARMY COMMUNITY DENTISTRY  
COMMUNITY DIAGNOSIS

by

LIEUTENANT COLONEL JAY D. SHULMAN



### Introduction

It was six men of Indostan  
To learning much inclined  
Who went to see the Elephant  
(Though all of them were blind),  
That each by observation  
Might satisfy his mind.

The First approached the Elephant  
And happening to fall  
Against his broad and sturdy side,  
At once began to bawl:  
"God bless me! But the Elephant  
Is very like a wall."

The Second feeling of the tusk,  
Cried, "Ho! what have we here  
So round and smooth and sharp?  
To me 'tis mighty clear,  
This wonder of an Elephant  
Is very like a spear."

The Third approached the animal  
And happening to take  
The squirming trunk within his hands,  
Thus boldly up he spake:  
"I see," quoth he, "the Elephant  
Is very like a snake!"

The Fourth reached out an eager hand,  
And felt about the knee.  
"What most this wondrous beast is like  
Is mighty plain," quoth he;  
"Tis clear enough the Elephant  
Is very like a tree."

The Fifth, who chanced to touch the ear,  
Said: "E'n the blindest man  
Can tell what this resembles most;  
Deny the fact who can  
This marvel of an Elephant  
Is very like a fan!"

The Sixth no sooner had begun  
About the beast to grope,  
Then seizing on the swinging tail  
That fell within his scope,  
"I see," quoth he, "the Elephant  
Is very like a rope!"

And so these men of Indostan  
Disputed loud and long,  
Each in his own opinion  
Exceeding stiff and strong,  
Though each was partly in the right,  
And all were in the wrong!

MORAL

So oft in theologic wars,  
The disputants, I ween,  
Rail on in utter ignorance  
Of what each other mean,  
And prate about an Elephant  
Not one has ever seen"

From "The Blindmen and  
The Elephant"  
by Godfrey Saxe

Dental care providers approach community diagnosis in much the same way that the blind men approached the elephant. Each provider sees a different piece of the community. In civilian practice, for example, the community is limited to those who seek care. Even in the military, where price is not a barrier to treatment, care providers do not see the whole community. My aim today is to provide you with a perspective from which to diagnose your community. Practitioners of public health dentistry, of which preventive dentistry is a part, must see the whole elephant. We must be able to step back and focus on the community rather than on individuals. The community is our patient.

For the purpose of this discussion a community is a group of people with something in common. This common factor can be geographic (a city), socioeconomic (the poor), or membership (a union). Furthermore, communities can have several factors in common. Using this framework, or paradigm, we can view the community of eligibles for a state medicaid program (Figure 1) as having geographic (residence within the state) and socioeconomic (income) components.

The community of eligible patients of a private dental practice can be viewed as having socioeconomic (income) and geographic (residency) components (Figure 2). The community of eligible patients of the military health care system can be viewed as having only a membership component (Figure 3). The community of eligible patients, or catchment, of a DENTAC is defined by membership and geography (Figure 4).



Often, it is useful to subdivide the DENTAC catchment by beneficiary status; active duty, dependent, and retired. Even the active duty community can be divided into garrison and field groups, or CONUS and OCONUS groups.

I would like to elaborate on a statement that I made earlier, that the community is our patient. Clinical treatment can be viewed as having five stages: history and examination, diagnosis, treatment planning, treatment, and patient evaluation. This model can be extended to the community.

The stages of community treatment are: community survey analysis of the survey, program planning, program operation, and program evaluation (Figure 5) [1]. Note the parallelism of the clinical and community treatment models. I will address my comments to Stages 1 and 2 of community treatment, survey and analysis.

### Community Survey

The tools of a clinical examination include mirrors, explorers, radiographs, and periodontal probes. For a community examination, or survey, these tools must be supplemented with analytic tools from the fields of epidemiology, the social sciences, and statistics.

Before discussing epidemiological tools I would like to introduce the concepts on incidence and prevalence. Prevalence is the number of cases (of disease) existing in a population at a point in time. If you examined children for fluorosis, for example, the number of cases per population (e.g., number of affected children per 10,000) would be the prevalence rate. Incidence is the number of new cases per population in a disease-free population or the number new attacks (e.g., new carious lesions) of disease in a population. The incidence rate measures the number of new cases of a disease and is useful in determining trends. Prevalence is determined by a cross-sectional study while incidence is determined by a prospective, or longitudinal study.

Figure 6 illustrates the design of a longitudinal, or prospective study. The first stage is a screening of the population (cross-sectional study) to identify diseased individuals. The proportion that has the disease is the disease prevalence. If, for example, there were fifty cases of oral cancer in a population of 50,000, the prevalence rate would be 0.1 percent. Once the fifty diseased individuals are identified, the remaining (49,950) disease-free subjects are followed for the course of the study and examined. The proportion of the disease-free population (49,950) who acquire the disease during the study period is the incidence rate.

Indices comprise an important set of tools for describing a community. An index is a numerical value describing the relative status of a population on a standard, graduated scale [2]. It makes it possible to compare communities as well as subgroups within a community. It may simply be the proportion of people having an attribute. Such rates are useful in describing conditions that occur with low frequency, as for example, the oral cancer rate per 100,000 persons per year. A simple proportion would not describe caries and periodontal disease prevalence adequately since they are so widespread that rates for some groups would approach 100 percent and the diseases affect the population in varying degrees of severity.

The most common caries indices are the DMFT and the DMFS. The DMFT is the total of decayed, missing, and filled permanent teeth and ranges from 0 to 32, while the DMFS measures decayed, missing and filled surfaces. Specifically, D represents teeth with obvious, untreated caries; M represents teeth missing due to caries; F represents non-carious, restored teeth that are presumed to have been carious [3]. DMFT counts are generally made with a mirror and explorer while DMFS counts are supplemented with radiographs. The DMFT and DMFS are measures of caries experience and are cumulative. Consequently, an individual's DMF score cannot decrease. The DMFS is sensitive to multiple carious lesions in a tooth, while the DMFT records a tooth with one lesion the same as it records a tooth with several lesions.

You can get a feel for the DMFT by studying data from the National Caries Prevalence Study (1979-1980) in which over 45,000 children were examined (Figure 7) [4].

In theory, the interpretation of the DMFS and DMFT differs; with the DMFT describing the initial attack of caries (per person or per tooth) and the DMFS describing the intensity of the caries attack as well as the results of treatment or neglect. Despite the theoretical difference, there is little practical difference, and one can be estimated from the other.

The def index is analogous to the DMF and is useful in children 6 years old or younger. The "d" represents decayed deciduous teeth, the "e" represents deciduous teeth where extraction is indicated because of caries, and the "f" represents filled deciduous teeth. Since "d" and "e" both relate to caries they are often combined as a df index. The df index does not count missing teeth, consequently the removal of a carious tooth can lower the df. Unlike the DMF which measures cumulative prevalence (caries experience), the df measures only point prevalence.

Periodontal disease indices can measure reversible or irreversible processes. The Gingival Index (GI) measures the

extent of gingival inflammation (a reversible process) around each tooth on a zero to three scale [2]:

- 0 = Normal gingiva
- 1 = Mild inflammation (no bleeding on probing)
- 2 = Moderate inflammation (bleeding on probing)
- 3 = Severe inflammation (spontaneous bleeding)

An individual's score is the total count divided by the number of teeth. Missing teeth are not considered, therefore, the GI understates the disease experience in older groups.

The Periodontal Index (PI) is a weighted scale based on a visual examination that measures a combination of reversible and irreversible periodontal changes [2]:

- 0 = No periodontal disease evident
- 1 = Mild gingivitis
- 2 = Gingivitis
- 6 = Gingivitis with pocket formation
- 8 = Advanced destruction / loss of masticatory function

An individual's PI score is the total count divided by the number of teeth. Most people free from periodontal disease have PI scores less than 0.2. There are several measurement problems inherent in the PI. Since scores cannot be assigned to missing teeth, lifetime disease experience of older groups is underestimated. The mirror and explorer examination is cursory and consequently understates disease prevalence. Finally, in the absence of inflammation past disease is overlooked since teeth are scored only if inflammation is present.[3]

While the GI and PI measure disease prevalence, the Simplified Oral Hygiene Index (OHI-S) measures the presence of debris and calculus. It is based on scoring four posterior and two anterior tooth surfaces; the buccal surfaces of selected upper molars, the lingual surfaces of selected lower molars, the labial surface of the upper right central incisor, and the labial surface of the lower left central incisor.[2]

#### DEBRIS SCORE

- 0 = No debris/no stain
- 1 = Soft debris up to 1/3 of tooth or extrinsic stain without debris
- 2 = Soft debris between 1/3 and 2/3 of tooth
- 3 = Soft debris more than 2/3 of tooth

#### CALCULUS SCORE

- 0 = No calculus
- 1 = Supragingival calculus up to 1/3 of exposed tooth surface
- 2 = Supragingival calculus between 1/3 and 2/3 of tooth or flecks of subgingival calculus
- 3 = Supragingival calculus more than 2/3 of tooth or band of cervical, subgingival calculus

The purpose of the survey is to determine the nature and extent of the problem. The survey should provide data about the health and characteristics of the community. Examples of health data are the prevalence (total amount of disease, such as number of decayed teeth) and incidence (rate of new disease, such as caries rate). Community characteristics include type of military facility, catchment size, type of active duty population, the existence of special mission requirements, age and race distribution, number and type of dental care providers, the number and location of school-age children, fluoride history, and the history of existing dental programs.

While it is not difficult to perform a thorough examination when the patient is an individual, it is rarely, if ever, feasible to examine every member of the community. One way of estimating community health is through sampling. For example, if a division dental surgeon wants to estimate the dental health of the division (his community) he could screen a sample of dental records. The validity of the screening is a function of the extent to which the records reflect the individual's health and the extent to which the sample represents his community. I will avoid the issue of how many records to screen (sample size) except to say that it depends upon how sure, or confident he wants to be that the sample represents the division.

Another method of community survey is the examination of a representative sample of the division. This has the advantage of not being dependent on the accuracy of the dental records. Its disadvantage lies in its cost, both in examiner and patient time. The problem of sample size is no different than it is in record screening.

You might have wondered why I haven't discussed using data from the Oral Health Maintenance Program (OHMP). While the OHMP

is a convenient source of data on the oral health of the active duty community, it is representative only to the extent that the entire community participates and the oral health of the non-participants is not substantially different from that of the participants. It is not difficult to see that the oral health of patients seeking treatment in a fee for service environment will be unrepresentative of that of people who do not seek treatment. This difference, or bias, is due to differences in attributes such as socioeconomic status, education level, and availability of care that are associated with seeking dental care.

Even when ability to pay is not an obstacle (as with military personnel) it is not safe to assume that the oral health of participants and non-participants is the same. Varying degrees of emphasis by unit commanders, conflicts with training schedules, differences in attitudes toward dental care and differences in socioeconomic status are but a few factors that could result in the OHMP not providing a representative sample.

### Community Diagnosis

Once the community has been surveyed it is possible to estimate its dental care needs. But needs are only one piece of the puzzle. Before I elaborate I would like to introduce some definitions.[5]

- Need - A professional judgement concerning the quantity of dental services that ought to be consumed over a period of time to optimize the oral health of the community.
- Want - The quantity of dental services that members of the community feel they ought to consume based on their perception of needs.
- Demand - The (complex) relationship between wants and perceived costs over a given time period. The costs are not limited to dollar costs. They may include waiting and travel time as well as perceived pain and morbidity.
- Access - The extent to which dental care is available. This includes location of treatment facilities as well as waiting time, transportation, and whether a soldier can get time off from duty.
- Use - The extent to which dental care is consumed.

It is critical that diagnosis of the Army Community consider the relationship among need, want, demand, access, and use. There are several reasons needs differ from wants. People may be reluctant to seek some types of dental treatment due to inertia, a wish

to avoid pain, or a fear of an adverse outcome. The most important factor responsible for the gap between wants and needs is patient ignorance; ignorance about what constitutes good dental health as well as ignorance about the extent of the preventive, therapeutic, and rehabilitative capabilities of modern dentistry. Gaps between wants and demands can be attributable to a conflict with a work schedule, perceived costs (e.g., waiting time, transportation costs), and a lack of confidence in the treatment facility. Gaps between demand and use are generally due to facility overload, and conflicts with the patients' work schedules.

In the civilian community the relationship among needs, wants, demand, and use is shown in Figure 8. Note that need, want, demand and use are depicted by progressively smaller circles, and that a small portion of "wants" lies outside "needs." It could also be argued that portions of "demand" and "use" could lie outside "needs."

While a similar model could be used to describe the military community, a more useful perspective is provided in Figure 9. This model identifies a subset of needs consisting of military priorities. These priorities are related to combat-readiness. Soldiers who are most likely to be deployed should be in the best dental health. The model suggests that increasing use (i.e., increasing productivity) does not meet military priorities unless the treatment is provided to soldiers in deployable units such as those committed to the Rapid Deployment Force. The major reason there is "unmet critical need" is that many soldiers in deployable units do not seek routine dental care. While this invisible community is easily ignored it should be considered in your community diagnosis.

My discussion has focused on the active duty community for two reasons. First, ensuring a combat-ready force is our primary responsibility. Second, it is important to realize that the active duty community is not homogeneous; that in diagnosis, treatment, and program evaluation we should take care to consider the differences within the active duty community as well as the difference between military and civilian communities.

## ENDNOTES

- [1] U.S. Department of Health, Education, and Welfare, Introduction to Dental Public Health, Public Health Service Publication No. 1134, United States Government Printing Office, Washington, DC, 1964.
- [2] Wesley O. Young & David F. Striffler, The Dentist, His Practice, And His Community, 2nd ed., Philadelphia: W. B. Saunders Company, 1969.
- [3] John T. Huges, R. Gary Rozier & Diana L. Ramsey, Natural History of Dental Diseases in North Carolina 1976-1977, Durham, North Carolina: Carolina Academic Press, 1982.
- [4] U. S. Department of Health And Human Services, Prevalence of Dental Caries in United States Children, NIH Publication No. 82-2245, December, 1981.
- [5] James R. Jeffers, et al., "On the Demand Versus Need For Medical Services And The Concept of "Shortage," American Journal of Public Health, 61 (January 1971), p. 46.

TABLES AND FIGURES



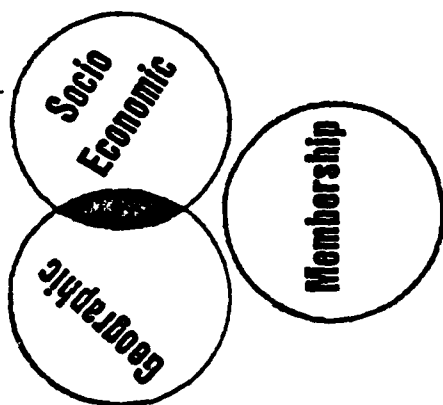


figure 1 STATE MEDICAID PROGRAM

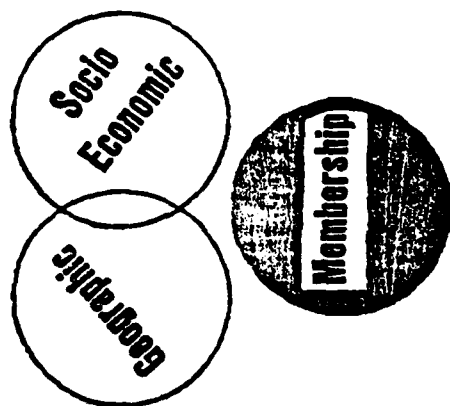


figure 3 MILITARY HEALTH CARE SYSTEM

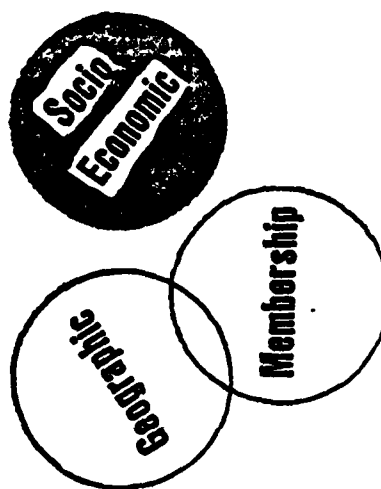


figure 2 PRIVATE DENTAL PRACTICE System

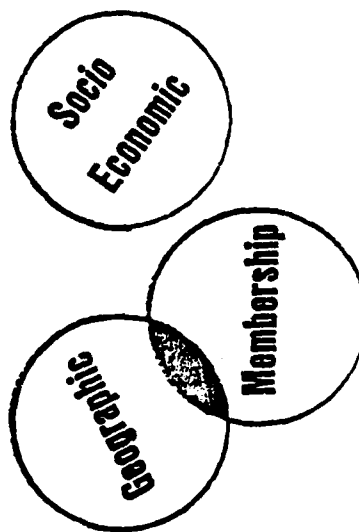


figure 4 POST LEVEL HEALTH CARE SYSTEM

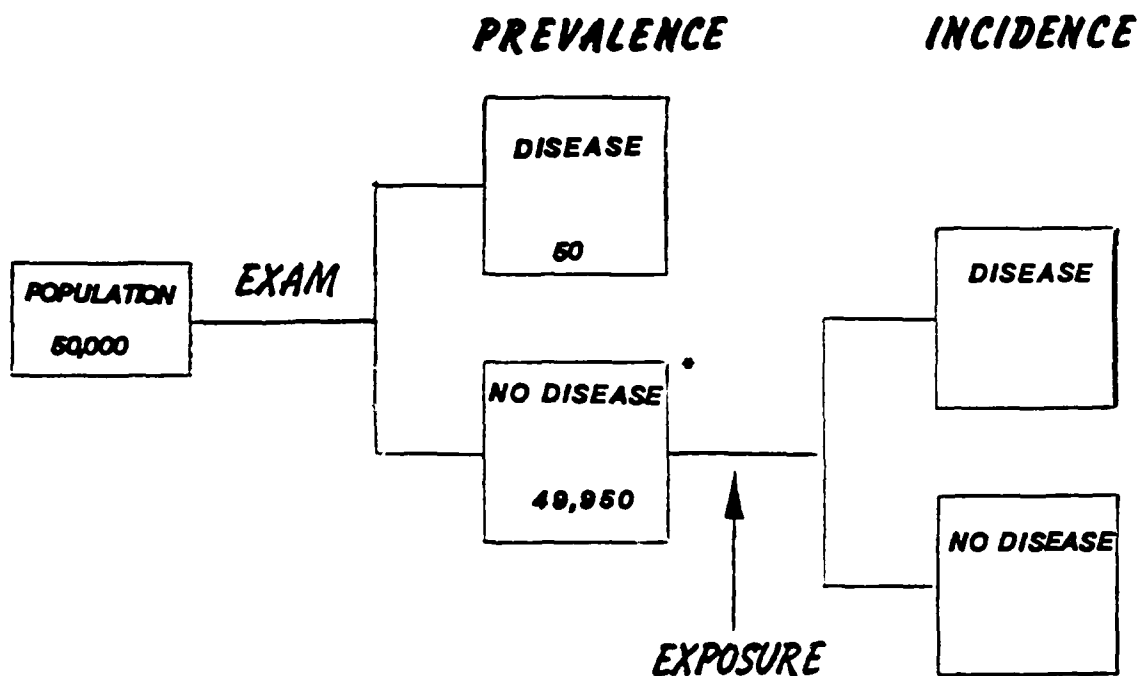
FIGURE 5. CLINICAL AND COMMUNITY TREATMENT MODELS

	<u>CLINICAL TREATMENT</u>	<u>COMMUNITY TREATMENT</u>
1.	HISTORY AND EXAMINATION	COMMUNITY SURVEY
2.	DIAGNOSIS	ANALYSIS OF SURVEY
3.	TREATMENT PLANNING	PROGRAM PLANNING
4.	TREATMENT	PROGRAM OPERATION
5.	EVALUATION	PROGRAM EVALUATION

FIGURE 6  
TYPE OF STUDY

*PREVALENCE OR INCIDENCE?*

*INCIDENCE (PROSPECTIVE) STUDY USUALLY  
STARTS WITH DISEASE-FREE POPULATION.*



*\*DISEASE-FREE POPULATION*

Figure 7

Mean DMFT of 45,000 U.S. Children

Age	Mean DMFT
5	.07
6	.16
7	.44
8	.90
9	1.26
10	1.69
11	1.96
12	2.64
13	3.38
14	4.04
15	4.94
16	5.54
17	6.35

Data from National Caries Prevalence Survey, 1979-1980.

FIGURE 8

# COMMUNITY PERSPECTIVE

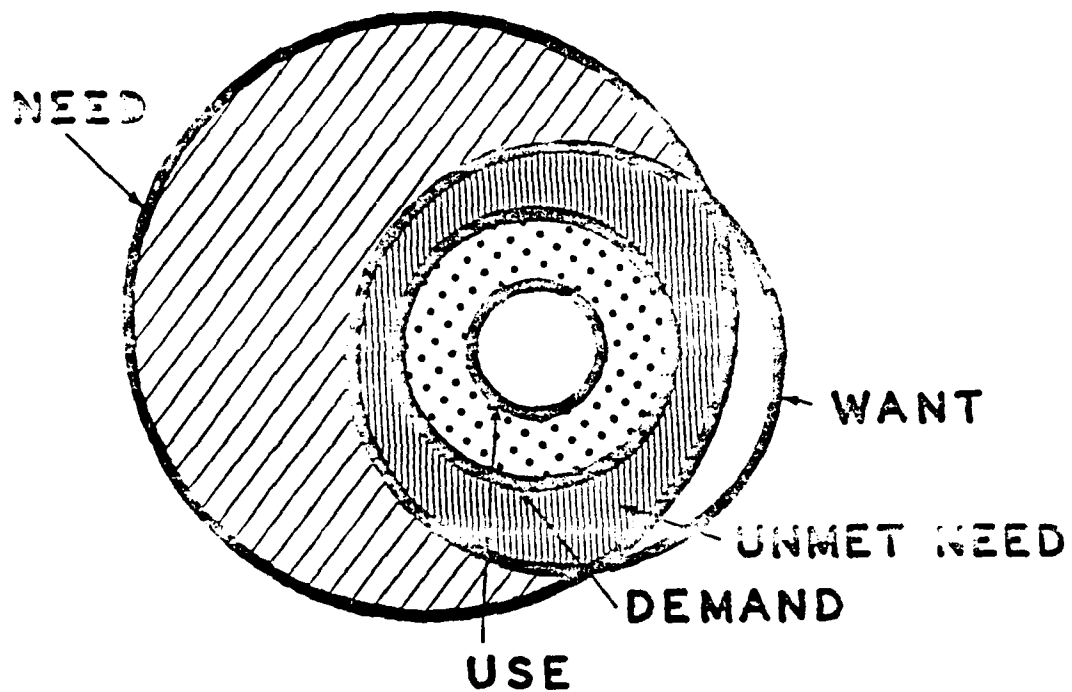
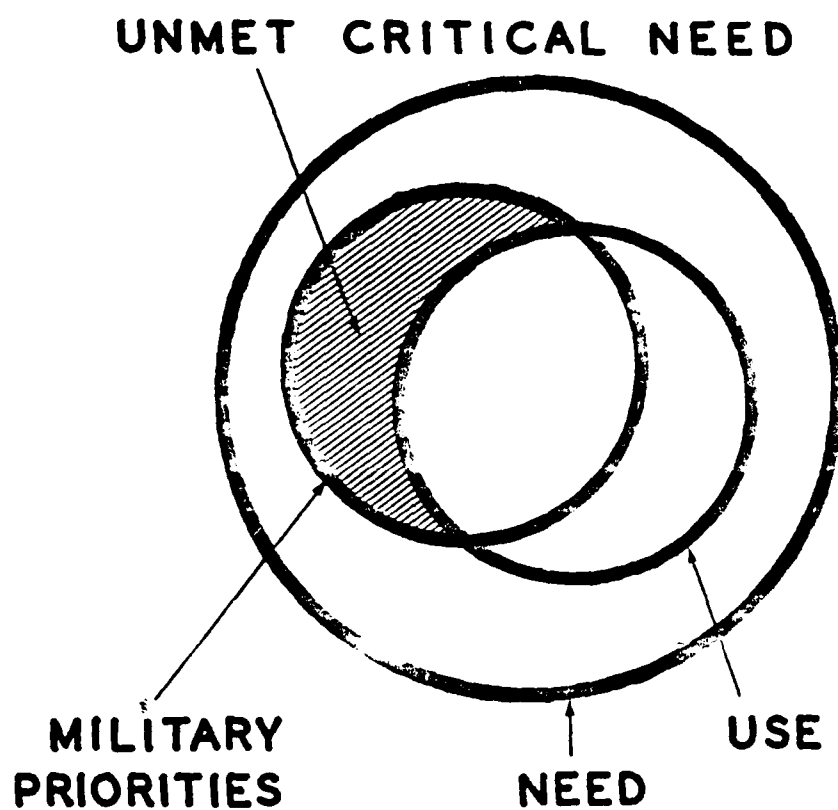


FIGURE 9

# MILITARY PERSPECTIVE



ARMY COMMUNITY DENTISTRY  
PROGRAM PLANNING

by

Lieutenant Colonel John E. King

## ARMY COMMUNITY DENTISTRY PROGRAM PLANNING

Planning is no different from anything else in the Army, there is a right way, a wrong way, and an Army way. As a matter of fact, the Army devotes major manuals to the subject of planning. Earlier today I talked as if planning was a simple uncomplicated, everyday part of life. Remember the vacation example. It is interesting to see the extensive diagram in the back of Army Field Manual 101-5 which describes the process a commander and his staff uses to arrive at an Operations Plan. The appearance is that the "Army Way" is far from simple and uncomplicated. However, after careful consideration of the diagram I found that the process is very similar to "lesson planning" I learned as an education major at Long Beach State College, the "treatment planning" I learned as a dental student at UCLA, and "community program planning" I learned as a graduate student at the University of North Carolina. In fact, "vacation planning" - I don't even know where I learned - appears to apply the same principles. The only difference I see in vacation planning and the other examples is in the degree to which I write down my plans. I get more involved in writing down my vacation plans only when I intend to meet with someone on the trip or if I try to inform a friend or relative of my visit to them. The more coordination needed the more I document my plans.

I think you can see, in the military environment where we are conducting a preventive dentistry program in the context of many other dental and military programs, documentation becomes very important.

The planning process helps me to identify problems, set appropriate goals, and provides me guidance for an orderly progress toward my goals. I write my plan because it helps my superiors to understand the plan and thus win their support. It justifies funds, and creates common understanding among the individuals and agencies who must coordinate their efforts. The written plan also provides criteria upon which I can evaluate success and efficiency of the plan. (See Figure 1) The rest of this presentation will be organized around 1) the PROCESS of planning and 2) the document of planning.

### PLANNING PROCESS

Using the clinical model analogy, LTC Shulman examined the community and identified the pathology. He also collected a lot of information which is analogous to a medical history. As in clinical dentistry we do not start treat



ment, even when we have identified the pathology, until we have examined the medical history for any factors which would influence our selection of methods of treatment. Just as a patient with a history of allergy to a specific antibiotic may influence our choice of therapy, a community which is a rapid deployment force may influence our selection of program elements.

Let me present an example of the diagnosis of a community and its use in program development. As a diagnostic aid to medical planning the Academy of Health Sciences has developed a database of information on the incidence of medical conditions which are important in a theater of operations. A void exists in the database- there are no routine dental conditions identified. When this database is used for simulation modeling it does not predict any need for dental care in the theater. This situation motivated the Assistant Surgeon General for Dental Services to direct the Dental Studies Division, Health Studies and Clinical Investigation Activity to complete a study on dental conditions in a theater. The results are not yet complete, however this examination of the unique community of US Army troops in a theater of combat operations has identified some dental pathology which is of importance to accomplishing the military mission.

Table 1 can be used to illustrate one problem which has been identified and is not amenable to treatment with preventive dentistry methods. One to five days lost to dental emergencies was reported from Vietnam and field exercises. [1,2] If the rate of dental emergencies remains constant we can see how this range can have heavy impact on combat effectiveness of the units in the theater. Community pathology: time lost to treat a dental emergency is extensive (a range of 1-5 days) causing a loss of combat manpower. A goal can be set to reduce the amount of time lost to dental emergencies to a specified level. Historical perspective indicates that the length of time lost per emergency is probably a function of the distance the soldier must travel to the dental facility. The method selected to help reduce the time has been to support doctrine which places dentists close to the units which they support. Other organizational changes are being advocated which relate to evacuation policies. The important concept to observe from this example is the process: examination, history, diagnosis, plan, to include the selection of methods. The missing item is evaluation of the outcome after the changes have been implemented. The question for evaluation is: Did the changes reduce the length of time a soldier is away from his duties for a dental emergency?

Data concerning maxillofacial injuries has identified a problem which will be addressed with a preventive dentistry research effort. Unpublished data at Walter Reed Army Institute of Research indicate that 51% of admissions to Vietnam Hospitals involved head, face and neck injuries. [3] (see Table 2) The

Department of Defense Medical Database used for simulation modeling of medical workload predicts 512 battle casualties daily in which maxillofacial wounds are the primary injury. [4] (see Table 3) This number does not include the maxillofacial injury in which the primary injury is to some other part of the body, nor does it include non-battle injury to the maxillofacial area. Treatment requirements for these 512 battle casualties alone will exceed the oral surgery capability of theater hospitals as they are presently staffed. Table 4 illustrates that maxillofacial injury may be increasing in importance with modern medical treatment and changes in weaponry. The percent of casualties who die in the hospital has decreased from World War II to the Korean action to the Vietnam conflict. The percent of wounds which are non-fatal has increased. These two comparisons indicate that overall battle injury survivability is improving, however, statistics on maxillofacial injuries have shown the opposite trend. Deaths due to head, face and neck injuries have become increasingly more common as a percent of all deaths, even as the percent of non-fatal wounds to this region has increased. Using this examination of the problem we have identified a problem. One of the methods chosen to preventively approach the problem has been for the U.S. Army Institute of Dental Research to undertake the development of a facial protective shield to prevent and reduce the severity of these injuries. As you can imagine, there are many other planning implications of this data.

Data which has much relevance to your preventive dentistry programs has to do with the occurrence of dental emergencies among combat troops during war and field training exercises. Table 5 illustrates how different rates of dental emergencies can impact on the loss of combat manpower. The worst case,[5] best case,[6] and average case (an average of results from four different studies from Vietnam and field exercises) [5,6,7, & 8] demonstrate the difference in lost combat manpower from different dental emergency rates. We have already discussed the goal which I have proposed is appropriate to a preventive dentistry program to deal with this problem. (See Figure 5.) The implications of this goal are that we must select methods beyond primary prevention to have a significant impact on the problem.

A community history would be the next step in our planning process. Each local program will have a unique history. I will present some information which I feel is pertinent to the HSC community.

In June 1979 a series of reports was generated evaluating the effectiveness of the Army Oral Health Maintenance Program (AOHMP). The results indicated: (1) Only 50% of those eligible for their annual dental examination actually completed that requirement.[9] (2) Lower enlisted ranked require more care and have a smaller percent of their needs met compared to officer ranks.[10] (See Table 6.) (3) Individuals with combat MOS have higher dental needs yet get less of their needs met compared to non-combat MOS soldiers.[10] (See Table 7.)

These facts are interesting in light of demographic profile of the Army which shows the largest proportion of our population is in lower enlisted ranks and are in combat MOSs.[11] (See Figures 2 and 3.)

Diagnosis and history of the community allows us to select methods to resolve the problems. I don't wish to get into the details of specific methods since the profile of any particular installation would create unique needs and environment. However, based on the general observations above, I would advocate methods of achieving annual dental examination which are designed to identify combat MOS personnel who have dental needs which might interfere with training or combat missions. This would require a dental classification system to help identify individuals who have potential for emergencies during combat or training. I would also attempt to educate line commanders and NCOs concerning the impact of dental condition on readiness and the status of their troops. When line personnel perceive that they might have a dental readiness problem I would also like to have a program ready for recommendation to them. Notice the emphasis on "their readiness problem" and our position of making recommendations to them, not seeking their support for our dental program. Troop level education should be directed towards preparing them to stay orally healthy in the combat/field training environment.

Figure 4 lists methods of prevention at primary, secondary and tertiary levels. Many of these methods (activities) might be selected for inclusion in the program. Having selected methods, we can proceed in planning for resources: personnel, facilities, equipment, supplies, and time. A complete plan would also address the funding requirements for these resources.

I will address implementation and operation of the plan tomorrow.

The final step in program planning is plan for evaluation. The importance of goal and objective setting becomes apparent when we discuss evaluation. Although I already invested a large portion of time on goal setting this morning I would like to spend a little more time in distinguishing between "mission", "goals", and "objectives". Apparently there is no right, or even Army definition of these terms. I will offer my definition simply to establish a common vocabulary. All three of these terms relate to describing a desired end result of activities.

Mission is a statement of desired end result by a major organization. It is broad in scope and stated in general terms. This morning I quoted the Secretary of the Army and Army Chief of Staff as stating the mission of the AMEDD. Army Regulation 10-2 states the mission of the Army Dental Corps and I understand it to also be the mission of the Dental Care System.

Goals are also broad in scope but tend to be more specific in defining the exact outcome which is desired. In health fields you may test the value of a goal by seeing if you can name a measure of health outcome by reading the goal statement. For example, the goal might be to reduce the dental emergency rate for XXX Battalion during field training exercises (or combat) to at least 100 dental emergencies per 1000 troops per year.

An objective is a statement of a procedural (or operational) results, not a health outcome. Objectives will be related to specific methods of operations. For example, we would like to have 80% of the eligible troops in a unit participate in the annual dental examination requirement of the Army Oral Health Maintenance Program.

With these definitions in mind I would advocate that a program plan should include provisions to evaluate both goals and objectives, (outcomes and processes). The very simple one-problem program plan in Appendix A will illustrate how closely goals and objectives are related to evaluation of outcome and process. Please take the time to read the example in Appendix A before proceeding to the next section.

#### THE PROGRAM DOCUMENT

The point has already been made that planning is possible without documenting it. It would be a rather fruitless effort however, if we ever want to implement our plan and we need anyone else's cooperation. In our complex system, in order to assure an HSC wide program, we must write the plans with enough uniformity of language and outline that others in our system can rapidly understand our program. Please refer to Appendix B for a recommended outline for a Preventive Dentistry File which will contain all of the elements of planning which have been discussed.

Some of the desirable characteristics of a plan are:

- 1) Objectivity- the purposeful relationship between identifiable problems, goals to overcome the problem, and the methods (activities) used to treat the problem.
- 2) Feasibility- the plan is capable of being carried out.
- 3) Balance- the avoidance of undue emphasis on, or disproportionate expenditure of resources on a single problem, goal or method.
- 4) Dynamic- the capability for rapid adjustment to changing circumstances (flexible).
- 5) Appraisability - susceptible to evaluation.

## ENDNOTES

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FIGURES

FIGURE 1. Reasons for planning.

## Planning To

identify problems

set goals

orderly direction toward goals

## Written Plan To

communicate with superiors

communicate for coordination

provide criteria for evaluation

FIGURE 2  
U S ARMY RANK GROUPING PROFILE

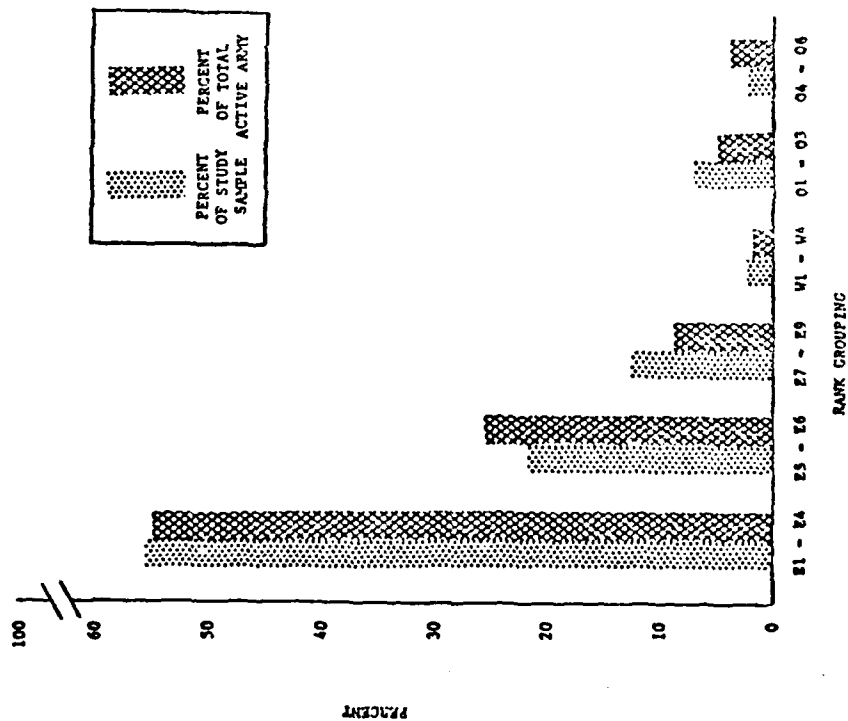
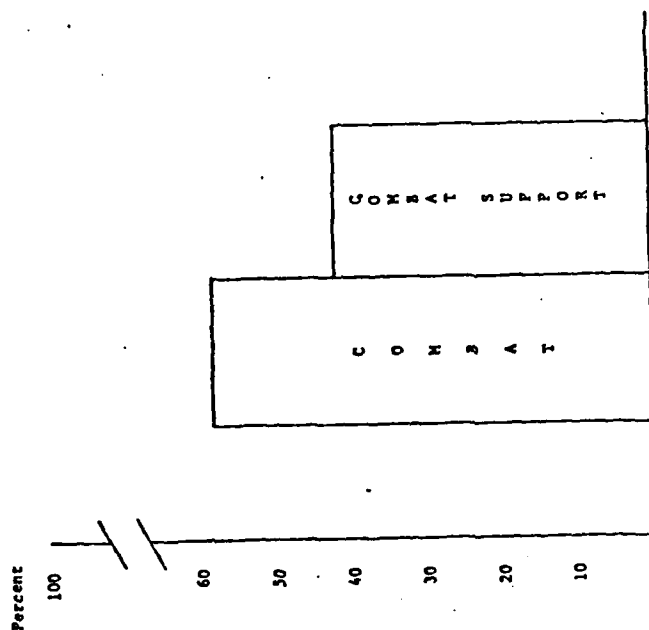


FIGURE 3  
US ARMY  
BASIC BRANCH/CAREER MANAGEMENT FIELD PROFILE



From Mayotte, et.al.



**FIGURE 4**  
Levels of prevention for dental disease.

Health promotion	Period of peripathogenesis (Primary prevention)	Period of pathogenesis		
		(Secondary prevention)	(Tertiary prevention)	(Tertiary prevention)
	Specific protection	Early diagnosis and prompt treatment	Disability limitation	Rehabilitation
Health education in oral hygiene	Good oral hygiene	Periodic detailed oral examinations with x rays	Treatment of well-developed lesions	Replacement of lost tooth structures by appropriate appliances (bridges, dentures, etc.) to restore harmony and function
Good standard of nutrition	Fluoridation of public water supplies	Prompt treatment of incipient lesions	Pulp capping	
Diet planning	Topical fluoride application	Extension of therapy into vicinity of lesions for prevention of secondary lesions	Root-canal therapy	
Periodic screening or inspection	Avoidance of sticky foods, particularly between meals		Restoration of natural teeth	
	Tooth brushing after eating	Attention to developmental defects	Extractions	
	Dental prophylaxis	Compulsory examinations of school children	Orthodontic treatment	
	Treatment of highly susceptible but uninvolved areas in highly susceptible persons (prophylactic odontotomy)			
	Preventive orthodontics			

Source: Adapted from Leavell and Clark.

from Dunning, James H. Principles of public health. 3rd ed. Cambridge, Mass. Harvard University Press 1979. xiv + 655 p. (p.222)

FIGURE 5

## Preventive Dentistry Readiness Goal :

To prevent dental emergencies among  
troops who are likely to deploy to a theater  
of operations .

TABLES

**TABLE 1.  
DENTAL EMERGENCY RATES in a THEATER of OPERATIONS**

<i>Varying Days Lost</i>					
	<i>Incidence Rate</i>	<i>Division</i>		<i>Days Lost</i>	<i>Man Days Lost/Div</i>
		<i>Strength (x 1000)</i>			
<b>WORST CASE</b>	<b>188</b>	<b>X</b>	<b>16</b>	<b>X</b>	<b>5 = 15,040</b>
<b>AVERAGE CASE</b>	<b>188</b>	<b>X</b>	<b>16</b>	<b>X</b>	<b>3 = 9,024</b>
<b>BEST CASE</b>	<b>188</b>	<b>X</b>	<b>16</b>	<b>X</b>	<b>1 = 3,008</b>

TABLE 2

**ADMISSIONS TO VIETNAM HOSPITALS FOR  
HEAD, FACE, AND NECK 1966-67.**

(from HARDAWAY, R.M., unpublished)

Primary wounds	24%
Secondary or associated wounds	27%
BOTH	51%

**TABLE 3**  
**DOD Medical Simulation Models**

**Medical Database predicts an incidence  
rate per 1000 troops supported for  
maxillofacial injuries.**

**0.64 per day**

**234 per year**

**$0.64/1000/\text{day} \times 800,000 \text{ troops} = 512 \text{ daily}$**

**TABLE 4**  
**Increasing Importance of Maxillofacial**  
**Injury to Combat Injury Rates.**

	<b>WW II</b>	<b>Korea</b>	<b>Vietnam</b>
<b>Hospital mortality rate</b>	<b>3.3%</b>	<b>2.4%</b>	<b>1.81%</b>
<b>Nonfatal wounds</b>	<b>75.5</b>	<b>80.3</b>	
<b>Deaths due to injuries to head, face, &amp; neck</b>	<b>25.1</b>	<b>32.2</b>	<b>46.0</b>
<b>Nonfatal wounds to head, face, &amp; neck</b>	<b>16.6</b>	<b>18.2</b>	

**TABLE 5**  
**DENTAL EMERGENCY RATES in a THEATER of OPERATIONS**

<i>Varying Incidence Rate</i>				
	<i>Division</i>			
	<i>Incidence Rate</i>	<i>Strength (x1000)</i>	<i>Days Lost</i>	<i>Man Days Lost/Div</i>
<b>WORST CASE</b>	<b>234</b>	<b>X 16</b>	<b>X 3</b>	<b>= 11,232</b>
<b>AVERAGE CASE</b>	<b>188</b>	<b>X 16</b>	<b>X 3</b>	<b>= 9,024</b>
<b>BEST CASE</b>	<b>142</b>	<b>X 16</b>	<b>X 3</b>	<b>= 6,816</b>



TABLE 7

## AOHMP EVALUATION STUDY, 1979

## Hours of Treatment by MOS Type

TYPE	SAMPLE SIZE	MEAN HOURS OF CARE NEEDED	MEAN HOURS OF CARE RECEIVED	PERCENT OF CARE RECEIVED
COMBAT ARMS	1552	5.03	1.42	28.15
COMBAT SUPPORT/ SERVICE SUPPORT	1098	4.84	1.60	33.16
TOTAL	2650	4.95	1.49	30.18

TABLE 6

## AOHMP EVALUATION STUDY, 1979

## Hours of Treatment by Rank

RANK	SAMPLE SIZE	MEAN HOURS OF CARE NEEDED	MEAN HOURS OF CARE RECEIVED	PERCENT OF CARE RECEIVED
E1-E4	1509	5.06	1.43	28.16
E5-E6	554	5.40	1.67	30.90
E7-E9	313	5.27	1.68	31.90
W1-W4	48	3.29	0.83	25.40
01-03	174	3.06	1.45	47.36
04-06	52	3.21	1.41	44.21
TOTAL	2650	4.96	1.50	30.20

APPENDIX A

EXAMPLE PROGRAM PLAN

## EXAMPLE PROGRAM PLAN

**PROBLEM:** Dental emergencies in a theater of operations (or during training exercises) cause significant interference with the combat (training) mission of individuals and units. (Ref. Ludwick, et.al. and King, et.al.)

**HSC GOAL:** To prevent dental emergencies among troops who are likely to deploy to a theater of operations.

**Line Unit Goal:** To reduce the dental emergencies in the XXX Battalion by 10% within 6 months after the start of the examination and report program.

### OBJECTIVES:

1. 90% of average daily troop strength will have a dental examination within 3 months of the beginning of the program.
2. The Commander of the XXX Battalion will receive a monthly report of the dental classification profile of his unit, and a name of the dental classification profile of his unit, and a name by name report of the classification of each member of his unit. This will be in his hands by the 5th work-day of the following month.
3. 90% of the soldiers who have been classified as having conditions which put them at high risk for a dental emergency in the next year will receive treatment to correct these conditions. This will be accomplished by the 5th month after the start of the examination and report program.

### METHODS:

1. The dental examination room and the evening and weekend dental emergency room will maintain a roster of all persons who report on sick call. Included on the roster will be the individual's name, rank, unit (to include battalion designation), and cause of emergency.
2. Unit rosters will be utilized to review records of all personnel assigned to XXX Battalion and classify each individual as to the completeness of his dental record and the status of his dental health according to his record.

3. At the start of the fourth month, after the dental sick call roster has been implemented, a report giving the dental classification profile of the unit and the classification of each individual in the unit will be used by the DENTAC Commander as the basis of an informational briefing on the impact of dental emergencies on training and combat. This briefing will be to the Commander and key staff of XXX Battalion. This Dental Readiness Report will be generated monthly by the DENTAC and sent to the Commander of XXX Battalion.

4. A dental "POR qualification" type examination will be provided in the XXX Battalion area using TOE dental equipment and Battalion dental personnel. This will be done on a day of the unit's choosing during the month of the initial briefing. Clinic appointments will be given to any unit personnel who are unavailable on the day of the Battalion area exams.

5. A priority system for appointing any individuals who are classified as high risk for dental emergencies will be established. It will include a system for company First Sergeants to make and adjust appointments for the high risk patients listed on his roster. The First Sergeant has the monthly responsibility to update the unit roster with the DENTAC.

6. Education on dental hygiene in the field will be scheduled into the training schedule for all companies.

#### GOAL EVALUATION:

Dental sick call rates will be established from a DENTAC emergency sick call roster for three months prior to the start of the examination and reporting program, and will be used for comparison with the monthly sick call rate in the sixth month of the program. The rate will be reported as the number of emergencies per hundred troops per month.

#### OBJECTIVE EVALUATION:

1. The DENTAC will be requested to keep a roster of the XXX Battalion on which they will record the date of examination of all unit members and the classification which resulted from the all unit members and the classification which resulted from the current examination or treatment. The Battalion Project NCO will determine the percent of the average daily troop strength which has been examined at the end of three months for the commander's Dental Readiness Report.

2. At the end of each month the Commander will be given a report of the percent of his troops which are in each dental classification (profile) and the names of those individuals who are in the high risk categories. The Battalion Project NCO will prepare this report from the DENTAC kept roster referred to in #1.

3. The fifth monthly Commander's Dental Readiness Report will include the current dental classification for each soldier who was at anytime in the five months of the program classified in a high risk category. And it will report what percent of those who were in the high risk category are now in the low risk category.

APPENDIX B

RECOMMENDED PREVENTIVE DENTISTRY FILE

# **Preventive Dentistry File**

**I. Program Plan**

**II. Resource File**

**III. Operational Records File**

**IV. Goal Evaluation File**



# **I Program Plan**

## **A. Problem 1**

### **1. Goal 1A (outcome)**

**Objective(s) (operational)**

**Methods (Activity)**

**Evaluation Plan for:**

**Operation**

**Outcome**

### **2. Goal 1B**

**Objectives (s)**

**Evaluation Plan**

**:**

## **B. Problem 2**

### **1. Goal 2A**

**:**

### **2. Goal 2B**

**:**

## **II. Resource File**

### **A. P.D. Doctrine**

### **B. Current Status**

**Problem 1**

**Problem 2**

**⋮**

### **C. Demographic Profile**

### **D. Biologic Profile**

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OF PREVENTIVE DEN. (U) ARMY HEALTH CARE STUDIES AND  
CLINICAL INVESTIGATION ACTIVITY F. J E KING APR 83  
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OF PREVENTIVE DEN..(U) ARMY HEALTH CARE STUDIES AND  
CLINICAL INVESTIGATION ACTIVITY F.. J E KING APR 83  
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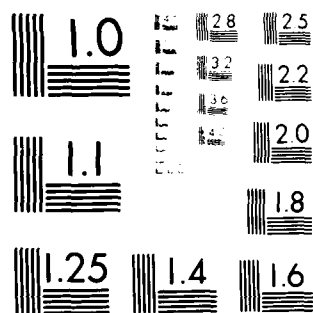
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PREVENTIVE DENTISTRY

IN

THE US ARMY

by

Colonel George P. Barnes

## PREVENTIVE DENTISTRY IN THE UNITED STATES ARMY

In November 1960, shortly after his advancement to the position of Chief of the U.S. Army Dental Corps, Major General Joseph L. Bernier, in a letter to all Army Dentists, announced his intention to expand the dimensions of military dentistry. "There is overwhelming evidence," he stated, "of an urgent need to establish an effective Army-wide military preventive dentistry program." He insisted that prevention offered the greatest hope of providing a better program of oral care. While fully supporting the conventional bio-mechanical approach to dental therapy, General Bernier initiated a new strategy in Army dentistry which stressed oral hygiene, dental education of the supported population, and oral health motivation of all patients. To General Bernier, preventive dentistry meant comprehensive dentistry.

During the mid 1960's, resistance to the program (more passive than active) was swept away by an almost evangelical fervor engendered by the new concept. Not only the members of the Army Dental Corps, but the remainder of the American dental profession as well, rapidly professed their conversion.

During the Vietnam War years (i.e. the late 1960's and early 1970's), a preventive dentistry infrastructure of considerable influence was established within the Dental Corps to monitor the progress of the program: A Preventive Dentistry Branch was organized in the office of the Chief of the Dental Corps; an Army Medical Services Advisory Committee on Preventive Dentistry was appointed; and the position of Preventive Dentistry Officer was created within the dental services at each Army installation.

During the 1970's the Army's Preventive Dentistry Program continued to expand. Program elements were designed and initiated to include all patients--both military personnel and their dependents. Every military member under age 25 (and all dependent children who attended on-post schools) self-applied a 9% stannous fluoride prophylaxis paste to their dentition on a semi-annual basis; efforts were made to insure that the communal water supplies of all Army posts were optimally fluoridated; all caries-prone patients received chairside applications of topical fluoride in the dental clinics. The efforts to educate and motivate all military personnel and their dependents toward personal oral hygiene and plaque control were redoubled. Army-supported research in the field of Preventive Dentistry was vigorously pursued at the U.S. Army Institute of Dental Research and at

numerous civilian dental schools: various chemical agents with plaque inhibitory potential were evaluated; an Intermediate Restorative Material (IRM) was developed for use among combat troops. As a result of using this restorative material, many teeth were saved which otherwise would have been extracted in the Southeast Asia combat zone. While searching for a more effective oral irrigator, dental scientists at the U.S. Army Institute of Dental Research developed a pulsating water jet device which proved to be a "far more effective means of debridement of contaminated and infected wounds than conventional methods." This device which was used in Vietnam in the decontamination and debridement of oral and facial as well as other combat wounds, proved to be highly effective in preventing secondary infections. Another significant element in the Army's preventive program of the 1970's involved the enrollment of many Army dentists into civilian dental schools in order to receive advanced training in Preventive Dentistry. Several of these officers received Masters Degrees and a few were awarded Doctors of Philosophy.

The U.S. Army's Preventive Dentistry efforts of the 1980's can rightfully be classified into one of three levels of prevention:

1. Primary prevention efforts designed to prevent the occurrence of oral disease.
2. Secondary preventive efforts include those efforts designed to control and prevent the extension of existing dental disease.
3. Tertiary preventive efforts include those efforts designed to prevent, control and eliminate the sequelae of oral disease.

When considered in the context of these three levels of prevention--primary, secondary, and tertiary--all dentistry practiced in the U.S. Army Dental Care System (whether this be fluoride therapy, amalgam restorations or full denture fabrication) is preventive in nature. Thus, General Bernier's standard of preventive dentistry of 20 years ago--that is comprehensive dentistry--is truly practiced throughout the Army in the 1980's.

The preventive dentistry activities currently conducted by the Army can logically be classified into three groups of programs according to the designated target population. These include:

1. Activities designed to prevent oral disease among both military personnel and their dependents.

2. Activities designed to prevent oral disease primarily among military personnel.
3. Activities directed primarily to the dependent population.

It can further be said that, while preventive dentistry programs vary in content from Army installation to installation, depending upon a variety of mission related and local factors, specific program areas generally fall into one or more of the following seven overlapping categories of activities:

1. Publicity activities.
2. Educational and patient motivation programs.
3. Diagnostic, examination and primary therapy program.
4. Public health measures.
5. School-based activities and other programs for dependent children.
6. Environmental protection measures designed to protect the health of patients and clinic staff.
7. Research activities.

The preventive dentistry publicity activities are targeted toward the entire supported population - both the military contingent and their dependents. These activities are designed to increase the awareness of all community members of the necessity for (and advantages of) good oral health as attained through preventive and definitive dental care. Examples of these publicity programs include: (1) the publication of articles concerning dental health, oral hygiene, and preventive dentistry in our installation, community, and command newspapers. Such articles often appear in the overseas daily newspaper Stars and Stripes; (2) the use of outdoor billboards advertising preventive dentistry; and the posting of dental health placards in various public places on our installations is another publicity technique. Quite frequently these placards will be observed in our post exchanges, commissaries, dependent schools health clinics, officers and NCO's clubs, as well as other prominent areas. (3) Dental health exhibits depicting the proper armamentarium for personal self administered preventive measures (and relating the proper techniques of using them) are



likewise located in these prominent areas. (4) In conducting their publicity campaigns, the Army Preventive Dentistry Officers habitually use local military radio stations and closed-circuit and Armed Forces Network television stations. Spot announcements concerning oral hygiene techniques, as well as programs of longer duration relating definitive preventive dentistry information are broadcast via these two mass media. While the publicity efforts in the area of prevention, by themselves, probably motivate very few of our patients to change their oral hygiene habits, they do create an awareness of the importance of dental health among the population, and they serve as a basis for our education and motivation programs.

The U.S. Army's preventive dentistry education and motivation activities are directed toward all of our patients whether they be military personnel or dependents. In contrast to previous years, when many of these programs were conducted as large group lectures given simultaneously to hundreds of troops in billets and theaters, our current educational activities are almost exclusively conducted in clinical environments, either in small groups of 6 to 12 patients each or else on a 1:1 basis. Both the small group classes and the 1:1 sessions may be conducted by dentists, dental hygienists and/or dental assistants. In some instances, the sessions are conducted via closed circuit television "aired" within the clinic. During the educational classes, patients are taught the role of dental plaque in oral disease and the methods of removing plaque, to include effective techniques of tooth-brushing, dental flossing and the use of water irrigation devices. During these sessions, patient participation is mandatory in order to insure that the individual can properly perform the prescribed procedures. In many instances, due to a deficiency in manual dexterity, patients are required to repeat these educational classes in order to master the techniques. The fact that these activities are conducted in small groups and on a 1:1 basis is significant. It is our experience that meaningful patient education is attained only in this environment, and true patient motivation towards personal plaque control is probably attained only on a 1:1 patient to professional basis.

Our diagnostic, examination and preventive therapy efforts are slightly different for military personnel as compared to those rendered to the dependent population. The vehicle used to insure that preventive services are provided to all military personnel is the Army Oral Health Maintenance Program (AOHMP). According to the precepts governing this program, every soldier, at least once a year, is mandatorily appointed in the clinic for a thorough dental examination (including radiographs). At this time they are exposed to the in-clinic education/motivation

programs. Following the examination, each soldier receives scaling and prophylaxis therapy using a fluoride containing prophylactic paste. Additionally they may receive topical fluoride applications if high caries rates are demonstrated. Following these procedures, military patients are offered appointments to receive all definitive therapy which they may require. Conversely, dependents of military personnel are not required to visit the dental clinic, but they may receive dental examinations and definitive therapy at any time, provided dental manpower and materiel resources are available. In most cases, as a minimum, dependents are provided in-clinic education and preventive therapy such as semiannual fluoride prophylaxis and topical fluoride applications.

The Army's dental public health measures consist primarily of communal water fluoridation programs. Since the early 1960's the Army has constantly expended maximum effort insuring that the communal water supply is optimally fluoridated on all military installations where children reside. Today a non-fluoridated Army installation is a rarity, and in those instances where this is the case, systemic fluoride supplements are available by prescription for children in residence. Systemic fluoride supplements also are prescribed for children of military personnel who reside in less than optimally fluoridated civilian communities.

Dependent children constitute the sole target population for the school-based programs. These programs are conducted within the dependent school facilities located on military installations and usually involve personnel from several segments of the community; to include students, school administrators and faculty, dental personnel, parents, and volunteer personnel such as those individuals provided by the Red Cross. The school-based programs are multi-faceted and usually include: (1) dental screening examinations for the students with the results and advice concerning need for care being forwarded to parents; (2) distribution to the students of preventive dentistry kits containing fluoridated dentifrices, toothbrushes, dental floss, and plaque disclosing tablets; (3) various dental education programs conducted in the classrooms by dentists, dental hygienists, teachers, school nurses, and other personnel; and (4) contributions by the Army Dental Care System of dental literature and dental health films to school libraries.

In 1980, a special fluoride rinse program was initiated in all of the dependent schools in Europe. For over 2 years all students in grades K through 8 (i.e. children age 5 through 13) have been rinsing once a week, for one minute with 10 milliliters of a 0.2% solution of neutral sodium fluoride. This rinsing procedure is conducted under dental supervision in the classrooms.

Currently approximately 50,000 students in Europe are enrolled in this continuously operating program. The total cost of this program, which is currently underwritten by Army Dental Services, was a little over 55¢ per child per year when initiated. While no efficacy figures are available on the dependents of Army personnel, per se, numerous clinical trials conducted elsewhere indicated that children participating in this program experience a 20% to 40% decrease in DMF increments.

Additional to the school based programs conducted in dependent schools, other groups of children habitually receive preventive dentistry instructions. Boy Scouts and Girl Scouts are frequently the recipients of these oral health program.

Our prevention efforts in the area of environmental health hazards includes both collective and individual efforts designed to prevent the transmission of communicable diseases within the dental clinics, and to protect patients and dental personnel from the hazards of radiation, mercury, communicable diseases, asbestos, projectiles and noise pollution. To meet these objectives all dentists, dental hygienists and dental assistants are required to wear face masks, gloves, ear plugs and protective lenses while treating patients. The use of asbestos is prohibited in Army dental laboratories. All personnel taking radiographs must wear film badges; patients routinely wear lead aprons while diagnostic x-rays are taken; and lead shields are used in all x-ray rooms. Numerous steps are taken to protect both patients and dental personnel from the hazards of mercury, including the storage of scrap amalgam under a minimum of 1.0 inch of glycerin. Through these and other measures the Army Dental Corps attempts to protect its personnel and its patients from environmental health hazards.

Much of the research in the field of preventive dentistry has, in the past, been conducted at the U. S. Army Institute of Dental Research. Epidemiological data, and clinical and laboratory data, concerning the effectiveness of various preventive agents, devices, and procedures have been collected by Army dental researchers stationed there. In the recent past, the Army expended much effort attempting to identify an effective chemical plaque inhibitor. For example, a mouthwash containing alexidine, and several others containing cetylpyridinium chloride and domophim bromide were evaluated extensively. Currently the US Navy is conducting all preventive dentistry research for the Army and the other two branches.

Thus, it is apparent that preventive dentistry in the United States Army was and still is a multi-faceted program manifested by a myriad of activities and efforts. Certainly these efforts will continue and the future should witness further expansion of

the Program. The philosophy of the Army Dental Care System is that preventive dentistry promotes higher morale among our personnel, better dental health for our entire military community, and a more effective Army.

PROGRAM OPERATION  
and  
PROGRAM EVALUATION

by

JOHN E. KING  
LTC, DC

## PROGRAM OPERATION AND PROGRAM EVALUATION

In the vacation analogy we have planned our trip, marked our map and made the reservations at the destination. We have even recounted stories of previous trips. It is time to start the trip. Bad weather, interesting side trips, alternate routes and other unplanned for events will occur. Because we manage the progress of our trip we will most likely make our destination. Your role is that of a program manager.

Your role in program operation is influenced by the military environment as well as the nature of the management process. It would be appropriate to look at these influences at this point.

The military influence is evidenced in the defined staff relationship with your commander, whether you are a PD Officer or a Public Health Dental Hygienist. If you are unfamiliar with defined staff relationships in the Army, I would recommend your looking over the first few chapters of FM 101-5, Staff Officers Field Manual, Staff Organization and Procedure.[1] Section II, para 1-4b states: "The commander alone is responsible for all that his unit does or fails to do. He can delegate authority, but not responsibility. He is assisted in performing command functions by a deputy or assistant commanders and a staff." The fact is that you are a member of the DENTAC Commander's staff and everything you carry out is entirely by his authority. This fact can certainly work to your advantage if you prepare implementing documents (DFs, Letters of Instruction, SOPs, and etc.) for the commander's signature with you as the "Point of Contact" or "Action Officer."

FM 101-5 also describes the five functions which you are expected to carry out as a member of the commander's staff: Providing information, making estimates, making recommendations, preparing plans and orders, and supervising the execution of plans and orders. Carrying out these defined functions will make you an asset to the commander's staff.

## PROGRAM OPERATION

The nature of the management process was examined in a 1968 Article in California Management Review by Richard Goodman.[2] He examined managerial actions in each of the components of the systems analysis scheme: Input, planning, operating and controlling. (See Figure 1.)

Looking at the operating section you can see what he perceives as the managerial tasks to implement and operate the program. Keep in mind that you manytimes find yourself in the role of "doing things" instead of managing. You must discriminate which activities you will do and which you will manage. The size and extent of your program and the amount of resources available will help to determine this as well as your capabilities and interests.

The manager motivates individuals to accomplish work; he leads many. Behavioral science literature suggests that there are group phenomena (such as group norms) which may constrain or facilitate activities.

The manager may direct, or give specific guidance to others while not doing the activity himself.

The interactions between individuals, agencies, and components of a program can only be carried out smoothly with coordination. Coordination among patients, SIDPERS, dental clinic reception desk personnel, clinicians, supported unit commanders and NCOs is required to make the AOHMP successful.

Several of our speakers today will discuss the operation of real programs. I am going to leave the subject of communications to look at the last area of management systems.

#### PROGRAM EVALUATION

The agenda for this time period called for "ACD-Program Evaluation." The purpose of evaluation is CONTROL. Although HSC is interested in knowing that you actively control your programs by evaluation of your success and efficiency in achieving goals and meeting objectives, the purpose of evaluation is NOT to satisfy a requirement.

As we drive on our vacation, we constantly assess our progress by watching the road signs, the gas gauge, the weather, the traffic, etc. Not usually because of our interest in these items themselves, but it allows us to make constant adjustments to the original plan to insure the most efficient progress. If we don't reach our destination, we should try to have information on the reason why so that we will be able to plan more effectively next time. We may have needed a more appropriate goal, or more effective objectives.

Please refer to the Example Program Plan in Appendix A of yesterday's presentation on Program Planning.

By examining the goals and objectives as specifically and measureably as we can, it is usually easy to see the ways to evaluate them. Notice in Figure 1 the Controlling Section of the system calls for a comparing of the plan with data collected on progress (outcome). These comparisons are used as feedback to other sections of the system. Feedback gained by evaluation allows the manager to justify more or different resources, set more appropriate goals and objectives, select different methods, or modify the operations.

The process is a dynamic one. We do not simply make a plan and carry it out to conclusion without variation from the plan. Evaluation is the process by which dynamics can be purposefully introduced.

#### - REMARKS

The remaining presentations of the conference are devoted to real programs. It is hoped that you will look for the programming principles in each of the examples.

Each DENTAC is unique in its needs and its community profile, so no prescription can be made for each installation without adequate diagnosis and history. The intent of this conference is to show how by public health management we can change a set of preventive dentistry activities into a preventive dentistry program. A program has unity of goals. It has a common direction for each of the individual activities.

If HSC is to have a preventive program instead of 38 separate DENTAC programs, I feel that there must be common goals and common program management practices among the DENTAC. I hope that your two days here will help to accomplish this.



#### ENDNOTES

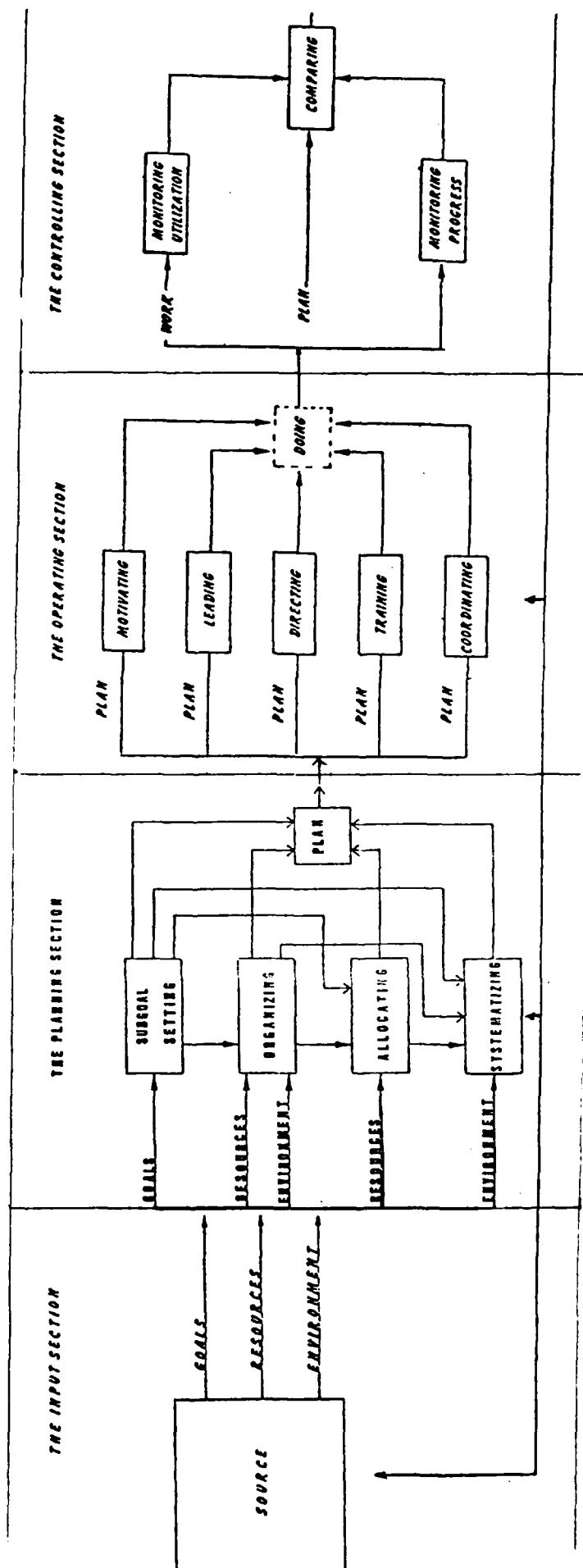
[1] Department of the Army, Staff Officers Field Manual, Staff Organization and Procedure, FM 101-5, Headquarters, Department of the Army, July 1972.

[2] Goodman, R. A., A system diagram of the functions of a manager. California Man Review, pp. 27-28, Summer 1968.

FIGURE 1

# A SYSTEM DIAGRAM OF THE FUNCTIONS OF A MANAGER (GOODMAN, R.A., 1968)

INPUT → PLANNING → OPERATING → CONTROLLING



DENTAL READINESS PROGRAM

AT

FORT KNOX

by

MS. PATRICIA BOWEN

## INTRODUCTION

We have been talking during the past day about public health program planning and the circle of need. I would like to take a few minutes to orient you to Fort Knox, and then I will discuss a program we have conducted on the post since September 1981 that we call the Dental Readiness Status Report.

The Fort Knox community is a varied one. We have a 200 bed hospital, the largest on-post school system in the United States, and four Brigades as well as assorted tenant commands. Within the military population, we have one brigade, the 194th Armored Brigade, which is the largest separate armored brigade in the world. The 194th is a Rapid Deployment Force, and as such places a high priority on combat readiness. The 194th makes up approximately 50% of our military population. The dental clinics (five) on Fort Knox are arranged so that each Brigade has its own clinic. The dental clinic for the 194th is DC7, a new 38 chair dental clinic.

When we look at prioritizing our public health dental programs, the best guidance that I have is the mission statement of the DENTAC. Our first mission is to "Maintain combat ready troops," and so we prioritize our time and effort to that mission. Since the 194th has the highest need for combat ready troops, being the Rapid Deployment Force on the post, they are the group that we target first within the military population.

### DENTAL READINESS STATUS REPORT (DRSR)

The Dental Readiness Status Report is simply a means of communication with the units that we service. It is a tool that enables the DENTAC to effectively communicate in the language of the Army - combat readiness. It assists the DENTAC in identifying problem areas of access to the dental clinics and is the first step in solving those problems. The Dental Readiness Status Report enables the DENTAC commander to discuss the status of troops with the unit commanders, and enables the DENTAC to "be on the same sheet of music" with the rest of the post. For management purposes, the DENTAC is very interested in accounting for dental procedures produced, however, line units are not as interested in our management as they are in a measure of combat readiness. They certainly sit up and take notice when you point out what "percent" of their unit is not POR qualified!

A really good point about the Report is that it identifies a problem for the commander - the unit commander, not the DENTAC commander. It is the DENTAC commander's responsibility to inform the unit commander of the oral health status of his troops (TB MED 5), but it is the unit commander's responsibility to get the troops in for their dental appointments (AR 40-3). The Readiness Report is just that - a report. There is no goal inherent in the Report, except to accurately record the dental health status of each service member and report it to the unit commander. This point is one that you have to keep reminding the clinics. Some clinics want to use a different goal - one of getting the most "As" on the program.

I would like to take you on a brief history trip of how the program began, and then I will go into how we implemented it on the post, and some of the problem areas that we discovered.

In the spring of 1981 Colonel von Gruenigen (then DENTAC Commander) and I approached the then 194th Commander, Colonel Pat Chisholm, with a program of field dental education. We were asking for some time to talk to his troops in the field about dental hygiene under combat conditions. During the discussion, Colonel Chisholm mentioned his feelings about the efficacy of the AOHMP as it was being conducted (his feelings weren't too thrilling). He felt it was just an exercise: get the troops in one door, examine them, and out the other door. He complained that the participation rate did not tell him anything about the problem that he was vitally concerned with which was how much dental sick call could he expect in combat. He requested that we develop a program to address this problem. He wanted to know the number and percentage per unit of troops who needed dental care to be combat ready. Even better, he wanted to be able to identify the individuals by name who needed dental work. So off we went. (Incidentally, we did get permission for the field dental program, and I will tell you about it later, briefly.

I started discussing the program with our SIDPERS people, MAJ Tudor, our Executive Officer, and I talked to the Chief of the AG Branch, who assured us that they would try to help. AG assigned a computer programmer, military type, who had worked with AOHMP and the purge programs that we were running at the time. While I was working with him, General Lefler came to Fort Knox for an address at the General Dentistry Residency graduation, and asked what projects were pending. The next thing I knew, I was on a plane to Fort Gordon, where they had been working on a similar program. I met with LTC Thomas E. Payne. The code definitions in Inclosure 1 are from LTC Payne.

He developed the definitions from dental studies, and was using them at Fort Gordon. Those became our definitions at Fort Knox. (You can see that his program certainly isn't a one person effort!).

Meanwhile, back at Fort Knox, we decided to use the purge roster, the one we use IAW AR 40-66 to purge our dental records twice yearly, as the basis of our program. We began the Readiness Program with just the 194th Armored Brigade, which numbers about 6000. We have since expanded it to include the entire post. The information in Inclosure 2 along with the code definitions was given to the clinics which, at the time, serviced the 194th units. (We were in the process of closing two old clinics and opening the new 38 chair facility.)

You can see from Inclosure 2 that we use five code categories. I divide the D and E categories because they are different actions at the dental clinic level. Some posts which are now using the system combine them into one group. The reception staff screened the records for the D and E categories, as they are an administrative determination, not a professional one. Dentists coded the remaining records IAW the definitions. As you can imagine, initial coding did take quite a bit of time. Monthly input of dental readiness codes to SIDPERS for our program is in the form of computer cards. We annotate a computer card with the appropriate dental code for each service member. Other posts use other methods of input, and the method of input is determined by SIDPERS, not DENTAC. The input method doesn't depend on the DENTAC's wishes as much as the SIDPERS capabilities.

I turn the cards in to SIDPERS, using the required paperwork. I count the cards on a fancy machine they have. This is our input. Two days later, we have Dental Readiness Status Roster with the code categories beside each service member's name. (See Inclosure 3.) Our program is written so that each unit is listed separately, the code is beside each name, and at the bottom of each unit is a total of the number and percentage of the code categories. Some of the names do not have a code by them. These are new personnel to the unit and they have not yet been classified. A little later I will show you an interesting fact that came to light when we studied the inprocessing problem. These personnel are coded with the appropriate code as soon as their name appears on the roster. There is also a brief category description at the bottom. The persons using this roster are not dental personnel. They are primarily the unit First Sergeants. We tried to keep the descriptions as simple as possible.

You will notice on your sample Dental Readiness Roster that the personnel due for their AOHMP have "Annual Dental Exam Due" annotated to the right of their name. We use the terminal digit system for the AOHMP. Each terminal digit group is keyed to a certain month - and our computer is programmed to notify soldiers of the requirement on that basis.

By the way, this sample Dental Readiness Roster is not for a 194th unit. CSM Wolfe wouldn't let any of his units have that many Ds and Es!

Inclosure 4, Figure 1 is a profile of the 194th Armored Brigade in September, 1981. You can imagine that the Commander and CSM of the 194th were not too thrilled to see the high number of non-POR qualified personnel (those classified D and E) in the Brigade! By the Way, the definition we use of POR qualified is that to be qualified you must have a dental record and panorex and current exam. This is the bottom line as I understand it, with the present regulations.

After we had given this information to the 194th, we got a commitment from them to support the effort to get the unit into the clinic for treatment. This support currently takes the form of three E6s from the 194th Brigade permanently at the dental clinic to make appointments for AOHMP, D, and E personnel, as well as keeping track of broken appointments, working with the computer program, and trouble-shooting. Currently one is an engineer, one air artillery, and one a records clerk. CSM Wolfe will tell you more about why he provides this support, and what he does when he gets IG gipped on them. My office is in the front wing of the clinic, adjacent to the plaque control room of the clinic, and the sergeants have the two offices that are also in that wing. They are a little rough around the edges compared to the usual dental personnel, but I want to tell you, they know their mission and they stay until it is accomplished. When you see CSM Wolfe, you will realize that you wouldn't want him upset with you!

So now we have the roster (at the beginning there were no Sergeants and I did the computer changing and coding) and the system began. After getting the Dental Rediness Roster, the first step in implementing the report system was workshopping all concerned personnel. We had already worked with the dentists and staff at the clinics that had coded the records originally. We made sure that each new staff member at the new clinic was briefed. We also began workshopping the 194th units. That was fun. I went through a testing period when CSM Wolfe seemed to call all the meetings at 0600 or 0630 (later on the times were better). CSM Wolfe first had a

briefing with the SGMs of each battalion and unit. Then we had a briefing with each unit First Sergeant utilizing the roster as a training aid. As time went on and we identified units that had a problem, CSM Wolfe directed them to meet with me at the dental clinic for an individual briefing. Currently, each outgoing First Sergeant brings the incoming First Sergeant to the clinic for a briefing on the program. Another handout that we use for briefings is the information paper on the Dental Readiness Status Report that you have at Inclosure 5.

You will note on the information paper, item #6, that the unit First Sergeant (or his designee) is to update a copy of the roster and return it to the dental clinic. The SIDPERS information is sometimes not completely current, and we don't want the unit to be penalized on the AOHMP for instance because some people were ETSed or PCSed or whatever. It is the unit's responsibility to inform us as to the status of their personnel. We do not have time to call all the line units and verify personnel status.

The briefings and CSM Wolfe's support paid off. You can see by the current profile (Inclosure 4, Figure 2) that there was a very significant improvement in the 194th Armored Brigade. There are currently 66 E category personnel in the Brigade. CSM Wolfe assures me that they will be changed soon!

#### RECORD AND PATIENT MANAGEMENT

I would now like to address the record management system and the appointment systems that coordinate with the program. In case some of you are wondering how public health dental programming is so involved with appointment systems, perhaps I better tell you how we see dental public health. We feel that dental public health deals with those programs that occur outside the environment of the dental clinic, and also with the means of patient access to the clinic. In other words, it's my job to get them interested in coming to the dentist, and then to make sure that there are no barriers to patient access once I get them interested!

Inclosure 6 represents the system we use for handling dental records. We blend three categories; AOHMP, code changes, and failed appointments, for the records that are held in the clinic. After the records leave the master file, and before they are returned to the master file, they are opened and checked to see if they fall in one of these three categories. If they do, they are not filed until the changes have been annotated on the roster, then records are refiled. This is kinda like deciding that you want to eat only the black jelly-



beans. The best way to get the jellybeans you want is to catch them before they go into the jar. If you wait, and the jar isn't made of glass, you have to take all the jellybeans out of the jar (check all the records in the master file) to find the ones you want. And that is a very time consuming job!

You will also note on inclosure 6 that we have another system for the new inprocessing personnel to the units. On our post all personnel new to Fort Knox go through the In-Processing Center, where they (supposedly) surrender their dental records. Our DENTAC runner picks up the records daily and gives them to the dental clinics. When we receive the records, one dentist at each clinic is appointed to screen the records, looking for pathology, referrals from other posts, and coding the records as appropriate.

I don't know if all of you know the progress of a dental record, but I would like to briefly review it - and the service member's contact with the dental world. At Reception Station, each person new to the service receives a dental record and panorex. These panorexes are screened by a dental officer (for GROSS pathology) such as tumors or impacted teeth that would weaken the jaw and make the service member vulnerable to a broken jaw during training. During Reception Station, Basic training, and Advanced training, the service member is told "emergency care only," as the mission of these areas is training. Often the service member has been in the Army for 6 or more months before he has his permanent party assignment and the opportunity for definitive dental care. We feel that it is very important to screen the record when the individual becomes a member of our "practice" - when they are "our" patient.

If there is any problem with the panorex, or if a dentist from another post has written a note, such as, "endo appointment ASAP," the service member is contacted to come to the dental clinic immediately. If there is no problem, they are coded as appropriate and scheduled in accordance with the code.

One of the problem areas that we identified almost immediately was with inprocessing personnel (see inclosure 7). I don't know what the rest of you are doing out there, but the majority of personnel inprocessing to us are either Ds or Es! Just kidding, a great number of personnel we receive are directly from AIT. CSM Wolfe stepped in again when we showed him this problem. Now, in the 194th, when the service member inprocesses to his unit, part of the inprocessing is to visit the dental clinic. When the service member visits the

clinic, we assure that he has a record, and if he needs a record or panorex he will get one at that time. If the individual needs an exam, we find a dentist to work him in. When he leaves he is in either A, B or C category. This is really helping with POR, as well as giving each service member the opportunity to find out about the available dental care on the post. (CSM Wolfe is no dummy, all the systems that we have set up really cut down on the time spent in the POR line for dental when an Emergency Deployment Readiness Exercise (EDRE) is called. And that's the name of the game!)

We use an appointment system at Fort Knox at the request of the units, for AOHMP, E and D category as well as for the operative appointments. It seems that with the appointment system the First Sergeants have a means for control of accountability of their troops. Our AOHMP is on the terminal digit system. Soldiers who are due an annual exam are on the roster, and the First Sergeant or his designee comes to the dental clinic after receiving the new month's roster and makes the appointments. The 194th is in the field quite a bit and we open the books for them for the full month so as to work around their schedule.

Appointments for D and E personnel are also made at the same time (or called in as required). As I mentioned, I divide those groups because they are different administrative actions. If an individual is an E, he does not necessarily need to see a dentist, but he does need to come in and make up records and have a panorex made. This is best scheduled when the front desk and the X-ray department are not extremely busy. For instance, I wouldn't schedule Es during the beginning of sick call. On the other hand, a D does need to see a dentist, and we either combine them with the regular AOHMP appointment schedule, or we have what we call a "special," when only D code personnel are scheduled. Inprocessing personnel with E and D needs are worked into the clinic schedule.

Our C category personnel of the 194th are handled a little differently. We open our operative books for two weeks at a time, and then close them. They fill up fast, and sometimes the C personnel aren't calling at the right time. Sometimes they are reluctant to make appointments. The appointment clerk is given a list of C personnel from each unit, with the First Sergeant's name and phone number. Before the books are opened to the general population, a certain number of slots are reserved for the C category personnel. The appointment clerk calls the unit, and the First Sergeant selects the personnel that are available to fill the slots. That way we slowly work the number of C category personnel

down. Appointments are available at the front desk for A, B, and C personnel as requested. Only the reluctant Cs are encouraged in by the special appointment system. (Remember that 18 year sergeant that you saw that prided himself on the fact he had never been to the dental clinic except for exams? - That's the one!)

Inclosure 8 is the Dental Readiness Status Report that I currently sent to the DENTAC Commander. He utilizes it in briefings and is planning to submit it to the CG of the post regularly for his emphasis and attention.

In June, 1982, the rest of the post went on the Readiness Program. I workshopped the clinic staffs, and Colonel Beckelheimer (the current DENTAC COMMANDER) has been briefing the Brigade Commanders about their dental readiness status. This month he will be presenting this information at the CG luncheon, where all the Brigade and tenant commanders will be present. SGM Fenceroy, our DENTAC Chief NCO, briefed the "Big 11," the CSM group on post, this week on the program. As I mentioned, the Readiness Report is a means of communication, and a good one! We have had an excellent response from the other Brigades, and are now working to streamline their systems like the 194th's.

#### FIELD DENTAL HYGIENE

One other aspect to our program with the 194th I previously mentioned I would like to address here. I said that this all started with a request to present field dental hygiene education programs to the 194th units. I do this primarily in the summer, and see the units on a yearly basis. Again, the programs are scheduled through the First Sergeants (sometimes the S3). I present a half hour talk on "How to Brush in the Dark." The areas I address are things like: how to use a twig as a toothbrush, why toothpaste can kill you if you use it in a guerilla situation, using a matchbook/match as a toothpick. These are subjects that are appropriate to field units and common sense oral hygiene techniques.

Since one of the most common reasons for sick call in the field is gingivitis we feel that this is a highly appropriate training program. I always end my talk with what I call the "POW Story" - a favorite of the 194th troops. I pass it on to you for your use.

One of the POWs who had been in Vietnam for five years came back to Fort Knox. He had left from Knox, and when he left, he had two small cavities. He returned with the same small cavities. They didn't feed him any sugar over there.

Most of the POWs that returned had periodontal problems, but this guy was fine. The clinic personnel asked how he kept his mouth so clean. He said, "I was kept in a wooden cage for 5 years. Every day they let me out for a half hour. During that time, I wet my finger and got some sand and brushed with that. While I was in my cage, I got slivers of wood from the cage and used them as toothpicks" The clinic personnel were understandably a little taken aback at this and asked why he did that, sand not being their idea of dentifrice. He said, "In the compound were people with broken legs and arms, and other injuries. They didn't receive any medical care. I knew that if I got a toothache or gum infection the only dental care I would get would be a rifle butt in the mouth. So I took care of myself."

And that is the bottom line when I talk to the troops. We can do only so much for them in the dental clinic. We feel that it is the mission of DENTAC to provide information so that the troops don't have any unnecessary pain while in the field - and gum disease is unnecessary pain.

A big part of our mission is carrying the dental message to the troop, to the field. I fly out to them, go on long jeep rides, and give presentations in garrison at 0600. We think it pays off.

One of our recent evaluations of the program was an exercise at Fort Irwin in January called Desert Thunder 83. We sent a dentist from Fort Knox along, and he kept statistics on forms provided by LTC King. LTC King mentioned that the usual rate of dental emergencies was 188/1000. During the exercise the dentist saw 27 emergencies out of 2547 personnel - a rate of 10/1000. (He was bored). Out of those 27, 4 were accidents, 4 gingivitis, and 4 p-cor. Although these statistics are not to the standard of some that have been presented during this program, both the 194th and the DENTAC were very happy with them. Almost one half (13) of the emergencies came from personnel in the unit adjacent to the dental tent. Could one postulate from that figure that if we didn't have the dental unit in the field we could cut dental emergencies in half? (I learned my statistics from a book entitled "How To Lie With Statistics.")

The Dental Readiness Status Report is an effective means of communicating with the units, pinpointing problem areas of access to the clinics, and gaining cooperation of the units to encourage dental utilization. The goal is a means of communication, not a competition among clinics as to who has the most A category personnel. The codes are not DENTAC's problem per se, but a unit problem that DENTAC has identified. Implementation and coordination is a combined effort - Commander, First Sergeant, Program Manager, clinic staff, and unit personnel.

## CRITERIA FOR ASSIGNMENT OF DENTAL STATUS CODES

Code A. Soldiers coded A should be in excellent oral health. Soldiers should not have carious lesions or clinically and/or radiographic evidence of untreated periodontal disease. Soldiers should have manifested a commitment to maintain their oral health. Because of the high incidence of pericoronitis under deployment conditions, soldiers with partial or total soft tissue impactions will not be classified as A.

Code B. Soldiers requiring routine dental treatment for conditions which are neither painful nor rampant. Oral conditions are unlikely to cause the soldier any significant problem within a twelve month period of time. Examples of Class B conditions include:

a. Oral Hygiene: Soldiers with light to moderate calculus with fair to good oral hygiene and no more than a mild gingivitis present.

b. Restorative:

1. Teeth with incipient caries or carious lesions which penetrate less than 50% of the dentin.

2. Teeth with restorations with defective margins with little or no recurrent caries.

3. Teeth with hard carious lesions (arrested caries or eburnated dentin) regardless of size.

4. Teeth with incisal or cuspal fractures which are asymptomatic, without caries, and with no evidence of pulpal involvement.

5. Teeth with large pin retained amalgam alloy restorations that ideally should be restored with full crowns.

6. Teeth that have previously been treated with sedative, temporary or intermediate type (IRM) restorative materials and are now asymptomatic.

c. Periodontics:

1. Soldiers on a periodontal maintenance program.

2. Soldiers requiring treatment for the correction of gingival defects or abnormalities.

3. Soldiers with chronic periodontal disease with periodontal pockets of 4-5 mm or less.

e. Prosthodontics:

1. Soldiers who can masticate food regardless of the number of teeth that they have lost.

2. Replacement of posterior teeth is indicated for maintenance of arch integrity or to prevent the extrusion of opposing teeth, but the missing teeth do not affect mastication.

3. Soldiers requiring esthetic replacement of anterior teeth.

4. Soldiers requiring relining or rebasing of existing prosthetic appliances that are not damaging adjacent anatomic structures.

f. Surgery:

Extraction or surgical removal of malposed or impacted teeth is indicated, but these teeth are asymptomatic with no evidence of pathology.

Code C. Soldiers requiring treatment as soon as possible for more severe dental conditions. Dental disease is rampant or associated with chronic infection and has a high probability of becoming acute or painful within the next twelve months. These soldiers should be considered as significant dental risks by their commanders. For units subject to mobilizations these individuals should not be considered POR qualified. Examples of Class C conditions include:

a. Oral Hygiene:

1. Soldiers with poor oral hygiene who have a high probability of developing an acute gingivitis or an acute necrotizing ulcerative gingivitis.

2. Soldiers with moderate to heavy calculus deposits which preclude maintaining adequate oral hygiene.

b. Restorative:

1. Teeth with rampant carious lesions - soft caries which penetrate 50% or more of the dentin.

2. Teeth with defective restorations with clinically

or radiographically recurrent caries involving over 50% penetration of the dentin.

c. Endodontics:

1. Restorable teeth with nonvital or necrotic pulpal tissue with or without radiographic evidence of a chronic alveolar abscess.
2. Restorable teeth which have had previous emergency endodontic treatment.

d. Periodontics: Advanced progressive periodontal disease with pockets in excess of 4-5 mm.

e. Prosthetics:

1. Soldiers that require complete dentures or removable partial dentures to properly masticate food.
2. Soldiers requiring relining of or new removable prosthetic appliances to avoid damage to associated anatomical oral structure.
3. Soldiers whose mission requires prosthetic replacement of missing anterior teeth for articulation.

f. Surgery:

1. Retained roots or non-restorable teeth.
2. Impacted teeth with clinical or radiographic evidence of pathology.
3. Oral lesions requiring biopsy for a definitive diagnosis.
4. Teeth with advanced progressive periodontal disease with a poor prognosis.

# IMPLEMENTATION

1. OLD SYSTEM			NEW SYSTEM		
COLOR	DEFINITION	CODE	COLOR	DEFINITION	CODE
Blue	no dental treatment	A	Blue	dentally combat ready	A
White	person who requires dental treatment	B	White	no readily diagnosed dental emergencies w/n 12 months	B
Green	no record or no recent exam	C	Green	existing pre-emergency conditions	C
			Yellow	no exam within 12 months	D
			Orange	no record/no exam	E

2. Have dentists review records for treatment status code priority (Inclosure 1).
3. Note code on computer card in felt pen (no red color).
4. Separate cards into A-E groups. Send D and E back to Program Manager ASAP. (These can be identified by non dental personnel, such as the reception staff.)
5. Group cards within the above groups, put rubber band around them, and send back to Program Manager as soon as the dentists have coded the rest of the cards.



# sample DENTAL READINESS STATUS ROSTER

NAME	SSN	ETG	DEA-C	REMARKS
TODD VAMON KENNEDY	507 051568008 080725			
TOTAL	1			
HARRISON HOWARD JR	5FC 503242205 081016	0		
TOTAL	1			
MCINTOSH WILLIAM GEORGE	136 775279122 035562	0		
TOTAL	1			
POWERS CAU AGENT ERENE	556 263003241 030316			
TOTAL	1			
WILSON ERNEST DUDLEY	556 18460057 030924	0		0000 DENTAL READINESS FOR 0000
LEE ROBERT LYNN	5P5 21044725 041062	0		0000 DENTAL READINESS FOR 0000
TOTAL	2			
SMITH JERRY DEAN	507 60607000 031013	0		
TOTAL	1			
ROQUEMORE HARVEY HARRISON	556 370543002 081111	0		
TOTAL	1			
WINTER HARVEY EUGENE JR	5P4 227999005 030612	0		
TOTAL	1			
WHITE ROBERT ALFRED	507 233000590 041120	0		
TOTAL	1			
FREE WILLIAM DANIEL LEE	5FC 420720196 081065	0		
LEE JOHNNY WILLIE JR	507 415645006 060562	0		
TOTAL	2			
STEWART DAVID WELTON	5FC 505566707 081065	0		
TOTAL	1			
ERDMANN DONALD NICHOLAS	417 517127590	0		
TOTAL	1			
UNIT TOTAL	15			

- AT DENTALLY UNPREPARED
- BY MC NEEDS DENTIST CERTAL EXPERIENCES WITHIN 12 MONTHS
- C3 EXISTING PAT-LEADGENCY CONSULTATIONS
- D1 MC EXAM WITHIN 12 MONTHS
- E1 MC PANDORA/MU RECIPES

10-15

INCLOSURE 3

DENTAL READINESS PROFILE  
194th ARMORED BRIGADE

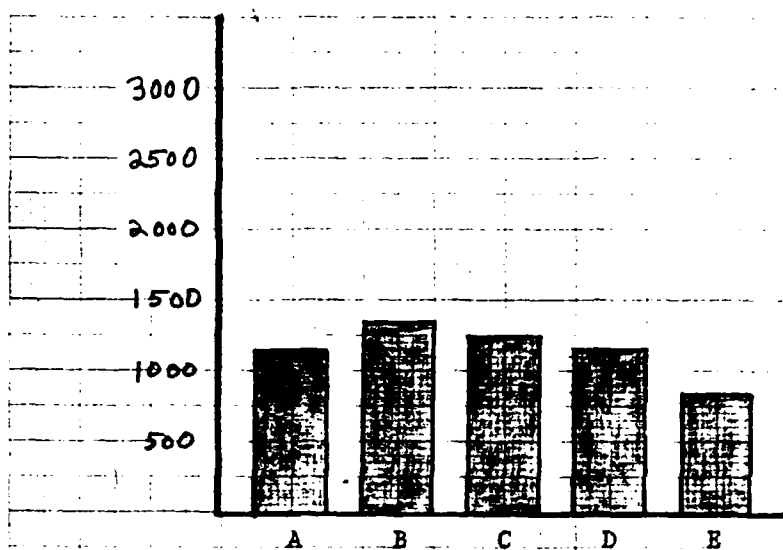


FIGURE 1. SEPTEMBER 1981

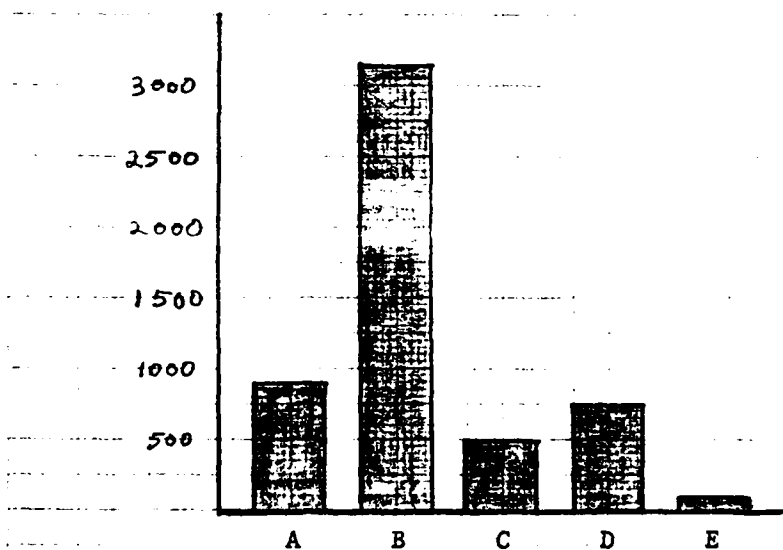


FIGURE 2. FEBRUARY 1983

INCLOSURE 4

INFORMATION PAPER

HSBM  
17Jan83

**SUBJECT:** Dental Readiness Status Report (DRSR)

**PURPOSE:** To provide current background information regarding DRSR.

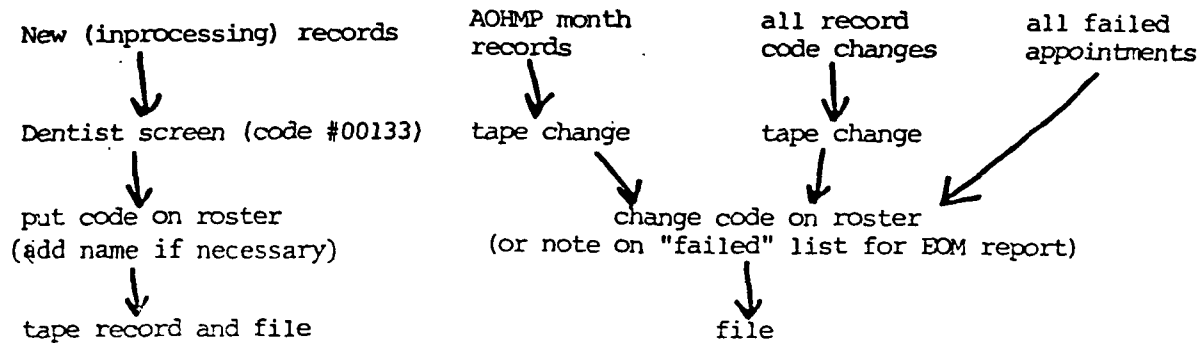
**FACTS:**

1. IAW TB MED 5, the DENTAC Commander will inform troop commanders of the current oral health status of their commands.
2. IAW AR 40-66, all SMs will have a complete dental health record at their servicing dental clinic.
3. IAW AR 40-3, all SMs will have a mandatory dental examination yearly.
4. The Dental Readiness Status Report roster was developed to inform unit commanders of the dental readiness status of their personnel. Status is shown by use of codes which indicate the expected loss of duty time due to emergencies in field or combat conditions.
5. Rosters prepared by AG SIDPERS are sent monthly from the servicing dental clinic to units. They list all unit personnel and show a dental status code for each as follows:
  - A - dentally combat ready
  - B - no readily diagnosed dental emergencies w/n 12 months
  - C - existing pre-emergency conditions
  - D - no exam w/n 12 months
  - E - no record/no panorex
6. Unit personnel are to update the roster as to ETS, PCS, TDY, etc., and return one copy to the servicing dental clinic before the end of the month.
7. Unit ISGs are requested to coordinate appointments for "D" and "E" personnel with the servicing dental clinic. All SMs should be aware that their dental records are to be kept at the servicing dental clinic.
8. Personnel due for their annual dental evaluation in accordance with the Army Oral Health Maintenance Program (AOHMP) are also noted on the roster.

Ms. Patricia Bowen/2829

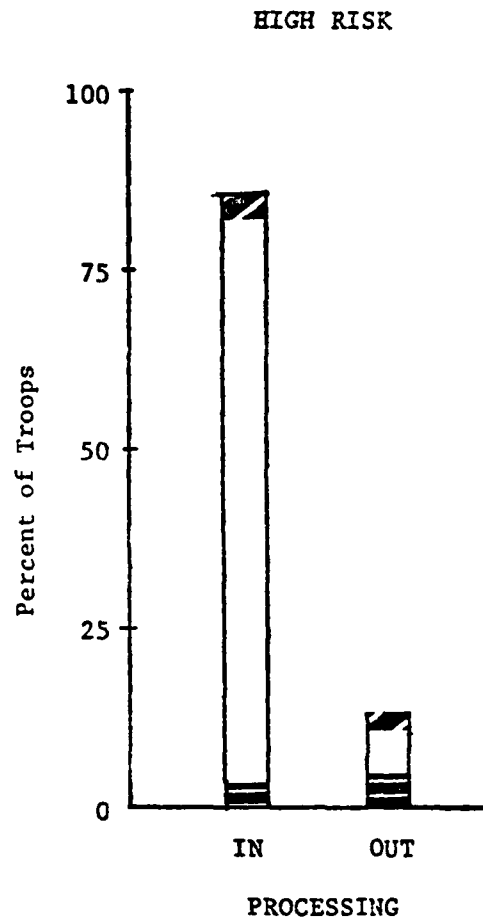
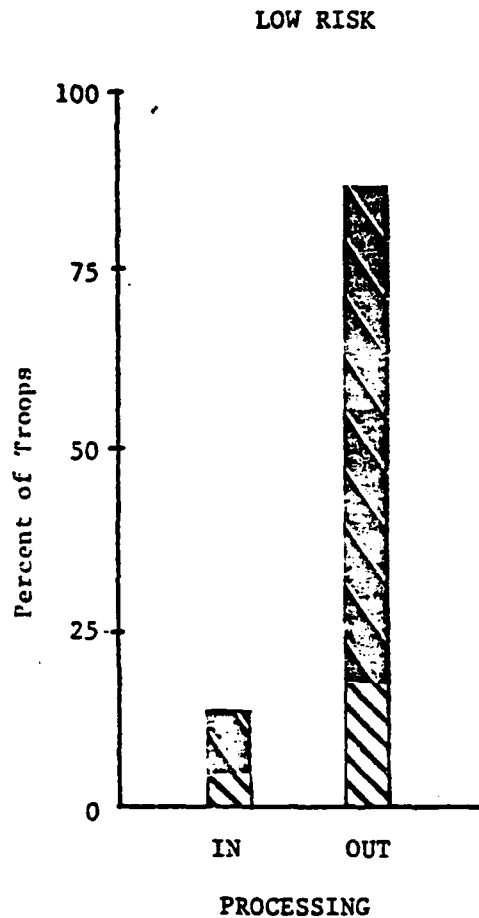
INCLOSURE 5

Record Management:



INCLOSURE 6

**DISTRIBUTION OF LOW-RISK AND HIGH-RISK DENTAL READINESS CLASSIFICATION\***  
**FOR TROOPS ENTERING AND LEAVING THE 194th ARMORED BRIGADE,**  
**FORT KNOX, KENTUCKY (1 JUNE - 1 DECEMBER 1982)**



- \* A - Dentally Combat Ready  
 B - No Dental Emergencies/12 Mos

- C - Pre-Emergency Conditions  
 D - No Exam Within 12 Mos  
 E - No/Incomplete Record

REFERENCE OR OFFICE SYMBOL	SUBJECT		
HSBM	Dental Readiness Status - January 1983		
TO Cdr, DENTAC	FROM CHDH	DATE 18Feb83	CMT 1

1. The following is a breakdown of Ft. Knox dental readiness status by unit for the month of January (roster dtd 11Feb83).

2. 194th Armored Brigade

UNIT	A(%)	B(%)	C(%)	D(%)	E(%)	TOTAL
19th En Bn						
Co A	18(13)	72(54)	7(5)	18(13)	0	134
Co B	25(19)	57(42)	13(10)	22(16)	1	134
Co C	16(12)	71(52)	12(9)	15(11)	0	136
HHC	48(25)	116(61)	12(6)	1	1	190
12 Finance	13(32)	19(47)	2(5)	0	0	40
30 Ord	10(16)	33(54)	8(13)	5(8)	2(3)	61
61 MD	1(33)	2(67)	0	0	0	3
431 MD	10(21)	29(60)	1(2)	5(10)	1(2)	48
42 Fld	55(26)	113(53)	7(3)	12(6)	12(6)	212
517 MI	16(22)	44(61)	9(12)	0	0	72
401 AG	16(19)	54(63)	7(8)	5(6)	2(2)	86
544 CS Bn	17(27)	33(52)	1(1)	4(6)	0	63
530 CS Co	42(20)	123(57)	14(6)	13(6)	2(1)	214
76 HEM	41(19)	128(60)	14(6)	13(6)	3(1)	214
13 En	30(22)	77(56)	6(4)	14(10)	1(1)	137
22 AG Repl	5(33)	6(40)	4(27)	0	0	15
514 Mn Co	37(18)	119(58)	20(10)	12(6)	4(2)	205
HHC 194th	54(18)	162(54)	22(7)	36(12)	3(1)	302
SC Plt	7(13)	35(66)	4(7)	4(7)	0	53
5/33rd						
Co A	7(9)	37(48)	6(8)	20(26)	3(4)	77
Co B	13(17)	29(39)	6(8)	22(30)	1(1)	74
Co C	10(12)	45(56)	6(7)	17(21)	1(1)	80
Spt	4(5)	45(56)	11(14)	19(24)	1(1)	80
HHC	18(10)	88(47)	21(11)	49(26)	0	185
160 Chem	0	3(100)	0	0	0	3
4/37th						
Co A	10(13)	44(57)	8(10)	8(10)	1(1)	77
Co B	6(8)	40(55)	10(14)	7(10)	1(1)	72
Co C	11(13)	43(52)	12(15)	6(7)	1(1)	82
Spt	20(24)	29(34)	9(11)	15(18)	2(2)	84
HHC	32(18)	85(47)	19(11)	15(8)	4(2)	179
D/10th Cav	16(12)	67(49)	10(7)	32(23)	6(4)	137
522nd En Co	35(15)	135(58)	27(12)	8(3)	0	231
3/3 Arty						
Bty A	11(11)	55(54)	11(11)	14(14)	1(1)	101
Bty B	14(15)	42(45)	8(8)	23(24)	0	94
Bty C	8(8)	61(58)	12(11)	12(11)	2(2)	105
SVC	8(13)	39(62)	5(8)	10(16)	0	63
HHB	57(20)	140(50)	22(8)	43(15)	2(1)	281

INCLOSURE 8

10-20

SUBJECT: Dental Readiness Status Report - January 1983

UNIT	A(%)	B(%)	C(%)	D(%)	E(%)	TOTAL
4/54th In						
Co A	13(9)	79(53)	22(15)	16(11)	2(1)	150
Co B	16(11)	75(52)	17(12)	26(18)	3(2)	145
Co C	19(14)	63(45)	28(20)	12(9)	1(1)	139
Spt	17(12)	67(50)	19(14)	14(10)	2(1)	135
HHC	26(14)	108(89)	10(5)	21(11)	4(2)	182
75th CS						
Co A	26(21)	69(55)	4(3)	12(9)	0	126
Co B	19(16)	68(59)	8(7)	11(9)	2(2)	116
Co C	19(13)	76(53)	15(10)	25(17)	3(2)	144
Co D	54(19)	132(47)	25(9)	49(17)	1	280
HHD	18(19)	47(49)	3(3)	16(17)	2(2)	95
217 Chem Det	4(17)	12(52)	0	6(26)	0	23
TOTALS:	972(16)	3116(53)	517(9)	707(12)	69(1)	5859

3. 1st Training Brigade

UNIT	A(%)	B(%)	C(%)	D(%)	E(%)	TOTAL
HQ	33(22)	70(47)	10(7)	10(7)	16(11)	148
1st Bn	30(13)	66(29)	13(6)	14(6)	25(11)	229
2nd Bn	21(12)	79(46)	20(11)	15(9)	24(14)	173
3rd Bn	23(14)	91(55)	12(7)	11(7)	18(11)	164
4th Bn	26(15)	72(43)	16(9)	21(12)	15(9)	167
5th Cav	25(15)	70(42)	11(7)	19(11)	27(16)	166
6th Cav	26(17)	62(40)	14(9)	23(15)	20(13)	154
TOTALS:	184(15)	510(42)	96(8)	113(9)	145(12)	1201

4. 4th Training Brigade

UNIT	A(%)	B(%)	C(%)	D(%)	E(%)	TOTAL
HQ	14(27)	15(29)	1(2)	9(18)	8(16)	51
2nd Bn	18(33)	13(24)	3(5)	13(24)	6(11)	54
13th Bn	23(19)	44(37)	5(4)	33(27)	11(9)	120
15th Bn	19(16)	46(38)	4(3)	26(23)	14(12)	120
18th Bn	29(23)	43(35)	6(5)	35(28)	6(5)	124
19th Bn	28(23)	38(31)	5(1)	37(30)	12(10)	122
TOTALS:	131(22)	199(34)	24(4)	153(26)	57(10)	591

5. Lightning Brigade

UNIT	A(%)	B(%)	C(%)	D(%)	E(%)	TOTAL
1st Bn						
Co A	0	1(33)	0	0	1(33)	3
Co B	0	3(100)	0	0	0	3
Co C	2(100)	0	0	0	0	2
Co D	121(10)	644(54)	7(ns)	164(14)	167(14)	1182
Co A, USAARMC	56(12)	279(62)	1	42(9)	41(9)	447
Co C, USAARMC	47(11)	263(62)	3(1)	51(12)	41(10)	442
2/6 Cav						
E Trp	15(9)	70(41)	19(11)	23(14)	25(15)	169
G Trp	15(13)	43(38)	17(15)	27(24)	10(9)	114
H Trp	21(18)	40(35)	8(7)	9(8)	10(9)	115
HHT	43(18)	95(39)	30(12)	31(13)	28(11)	242
I Trp	9(8)	37(34)	17(16)	14(13)	13(12)	107
K Trp	9(8)	37(32)	14(12)	13(11)	19(16)	116
113 Army Band	6(15)	26(63)	1(2)	4(10)	3(7)	41

SUBJECT: Dental Readiness Status Report - January 1983

UNIT	A(%)	B(%)	C(%)	D(%)	E(%)	TOTAL
Lightning Brigade						
PCF						
HHC	2(5)	21(58)	0	3(8)	4(11)	37
Proc Co	1(6)	9(50)	0	1(6)	3(19)	16
TOTALS:	347(11)	1568(52)	117(4)	382(12)	365(12)	3036

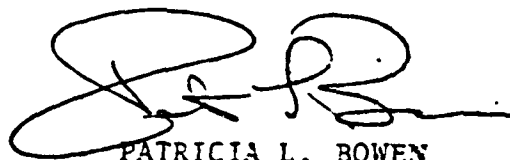
6. Other major activities

UNIT	A(%)	B(%)	C(%)	D(%)	E(%)	TOTAL
Comm Grp	86(26)	124(38)	7(2)	67(21)	29(9)	325
USARENBD	24(12)	129(63)	0	16(8)	16(8)	205
NCOA/DSS	29(24)	42(35)	7(6)	28(23)	4(3)	120
USARECSTA						
HHC	14(20)	21(31)	2(3)	19(28)	9(13)	68
Co A	5(26)	5(26)	1(5)	5(26)	3(16)	19
Co B	2(18)	5(45)	0	1(9)	3(27)	11
Co C	3(17)	8(44)	1(5)	4(22)	1(5)	18

7. Tenant organizations

UNIT	A(%)	B(%)	C(%)	D(%)	E(%)	TOTAL
543rd MP Co	21(11)	78(41)	19(10)	40(21)	18(9)	188
MEDDAC	98(19)	291(56)	11(2)	43(8)	64(12)	520
DENTAC	48(43)	53(47)	2(2)	5(4)	0	112
USA Tr Def Svs	2(33)	3(50)	0	0	0	6
ARI Field Unit	1(33)	1(33)	0	1(33)	0	3
Sp Scty Grp Det	1(25)	0	0	0	0	4
CI Cmd, 1st Reg	1(4)	11(44)	0	4(16)	4(16)	25
USA Comm Cmd	2(6)	22(69)	0	2(6)	3(9)	32
Reg II, ROTC	2(4)	31(62)	0	2(4)	7(14)	50
Read Reg Vi	24(13)	98(53)	0	17(9)	31(17)	182
43 Ord	1(9)	5(45)	1(9)	0	0	11

GRAND TOTAL:



PATRICIA L. BOWEN  
Community Health Dental Hygienist

NOTE: The columns will not add horizontally-because of new inprocessing personnel who are not yet coded.



EDITOR'S INCLOSURE

The following inclosure was placed with Ms. Bowen's presentation because of its value to participants as a guide to local installation community diagnosis. It is from a training document written by Ms. Bowen for the Fort Knox General Dentistry Residency.

POST NEEDS ASSESSMENT SURVEY

I. Patient population:

A. Active duty:

1. Number (record holding population) \_\_\_\_\_
2. Services provided: (circle)
  - a. emergency only
  - b. emergency and preventive
  - c. general dentistry
  - d. full, including specialties

B. Dependents:

1. Number \_\_\_\_\_
2. Services provided: (circle)
  - a. none
  - b. emergency only
  - c. emergency and preventive
  - d. general dentistry
  - e. full, including specialties

C. Retirees:

1. Number \_\_\_\_\_
2. Services provided: (circle)
  - a. none
  - b. emergency only
  - c. emergency and preventive
  - d. general dentistry
  - e. full, including specialties

II. Servicing personnel:

A. Number dentists: \_\_\_\_\_

1. Number general dentists
2. Number specialists
3. Reserve dentists on weekend? Yes      No

HSEM

SUBJECT: Post Needs Assessment Survey

B. Total Number dental assistants \_\_\_\_\_, including:

1. Number civilian expanded function \_\_\_\_\_

2. Number DTA trained military \_\_\_\_\_

C. Number dental hygienists \_\_\_\_\_, including:

1. Number civilian \_\_\_\_\_

2. Number OJT military \_\_\_\_\_

3. Number 8 week course military \_\_\_\_\_

4. Graduate Military MOS 91E30 X 2 \_\_\_\_\_

5. Graduate 18 week course \_\_\_\_\_

III Facilities:

A. Number of clinics: \_\_\_\_\_

B. Number of chairs: \_\_\_\_\_

C. Number of X-ray units: \_\_\_\_\_, including

1. panorex units: \_\_\_\_\_

2. Cephalometric units: \_\_\_\_\_

D. Separate facility for AOHMP exams?

Yes

No

E. Separate facility for Dependents?

Yes

No

POST NEEDS ASSESSMENT SURVEY

POST PROFILE

A. Main mission of post is: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

B. Active Duty:

1. Brigade, Major Activities or Tenant Commands (circle)

FORS COM

TRADOC

OTHER

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

list on other side if necessary

2. Companies requiring special dental status (AR 40-501)

Company

Status Required

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Are there special training requirements which remove troops for extended periods of time?      Yes      No

Which units? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Special Army schools or courses unique to post: (i.e. Armor Officer Basic, Infantry Officer Advanced Basic, NCO, etc.)

\_\_\_\_\_  
\_\_\_\_\_

HSEM

SUBJECT: Post Needs Assessment Survey POST PROFILE

- |                           |     |    |
|---------------------------|-----|----|
| 5. Reception Station?     | Yes | No |
| 6. Central Inprocessing?  | Yes | No |
| 7. Drill Sergeant School? | Yes | No |
| 8. Hospital?              | Yes | No |
| 9. Retired Organization   | Yes | No |

C. Community:

1. On post schools: Yes No  
(or school w/ at least 50% military dependents you are welcome in)

School	Grades	# Classes	# pupils
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Continue on back if necessary

2. School nurses? No. part time full time

3. Day care/nursery on post? Yes No

4. Active Red Cross Chapter? Yes No

Dental Program Yes No

5. Low cost transportation available from housing areas to dental clinics (bus) or clinics located in housing areas?

Yes No

6. Community Health Nurse system:

Van? Yes No

Satellite clinics? Yes No

Central Clinic? Yes No

HSEM

SUBJECT: Post Needs Assessment Survey POST PROFILE

7. Fluoridated water on post?

Yes No

8. Fluoridated water in surrounding communities?

Yes No

9. Hospital

a. Prenatal classes Yes No

b. Post natal program Yes No

c. Wellness clinic? Yes No

d. Preschool health screenings? Yes No

e. ICU unit? Yes No

f. Long term wards such as orthopedics? Yes No

g. Child Protection Case Management Team? Yes No

Dental representative on it? Yes No

DENTAL READINESS IN A LINE UNIT

by

CSM ROBERT G. WOLFE

It is a pleasure to be invited here today. As CSM of the 194th Armored Brigade, I work closely with the Fort Knox dental people, and Ms. Bowen tells me that we have a unique program in the Army. Seems that the 194th provides the best support for the dental effort, and some of you are wondering why.

All I can say is that when the dental people - COL von Gruenigen, LTC Mullinax, and Ms. Bowen - came to COL Chisholm and requested support he got it. Now, COL Chisholm had 18 problems that day - from equipment malfunctions to personnel problems, and to be truthful, dental wasn't necessarily on the top of the list. But COL von Gruenigen identified a problem with the 194th, a problem that affected our readiness status. As Ms. Bowen showed you, quite a few of the service members were not POR qualified.

Ms. Bowen briefed all my First Sergeants on the Readiness Roster - at 0600. She came to the meetings I have on Wednesday morning with my SGMs - at 0630. When she identified a battalion that wasn't responding to the program she called me, and I scheduled them for a meeting with her at the dental clinic. You want to get a SGM to cooperate with you? Kick him in the pride bucket - Show him that his unit isn't up to snuff. That handout you have from Ms. Bowen will be given to the CG of the post next month. Now that makes me sit up and take notice. My commander is rated by that CG, and I want him to look good. If a report is going to the CGs desk monthly I will be sure that it looks good for the 194th!

Now I'll give you a suggestion to get better cooperation. Get your regulation out of the 40 series of ARs and into the 350. The only people that read the 40 series are the medical people - the 350 series is the one that the line units are interested in. Now, I've been a soldier for a long time. I've been given orders - and some of them I've even followed. But when you tell me that something is mandatory, I don't have any choice. And COL von Gruenigen pointed out that this program is mandatory.

Right before I came here, SGM Fenceroy, the SGM of the DENTAC, presented information on the Readiness Program to all the Brigade and Tenant Command SGMs on the post. These people are the ones you want to reach - they are interested in the health and welfare of the troops. He requested cooperation from the units - and I jumped up and told him not to mess with my program as it was running fine. I presently have three E6s that work with Ms. Bowen at the dental clinic and they take care of coordinating with the unit 1SGs on appointments. They inprocess the new personnel to the unit and assure that



all service members are POR qualified. They also tell my 1SGs when a service member fails an appointment. The 1SG is accountable for his men at all times, and needs to know if a man isn't where he is supposed to be. We call it Failure to Repair and we may administer an Article 15 for the offense. I also have a School of the Soldier program on Saturdays for those individuals who need to learn how to make a dental appointment.

You asked about IG gigs on the 194th E6s who work at the dental clinic. Sure, I get them - get them regularly. But the IG isn't rating us, and the work that they are doing up there is helping my unit maintain a positive readiness profile. And that's my mission - to be ready to go to war. And when I get there, I want everyone in my unit - not half of the unit at the dental clinic. At the recent Fort Irwin exercise, the dentist that Fort Knox sent wasn't busy at all - and I was glad to see that! That shows me that the effort that we put into this program is working.

FLUORIDATION MONITORING  
IN THE US ARMY

by

MS. KATHY BECKER

## FLUORIDATION MONITORING IN THE US ARMY

It is a pleasure today to present subject matter near and dear to all of our hearts - Fluoride. The current literature abounds with studies and accolades for the power of fluoridated water supplies. Figures and statistics are impressive:

- At 1 p.m. a 65% reduction in dental decay is verified.
- Long term fluoride effects are substantially positive.
- The equipment and mechanism for introduction of fluoride into the water supplies is safe, effective and simple.

Yet, due to improper and careless monitoring of fluoride levels at water distribution points, the consumer of a potential health benefit is being cheated due to incorrect and ineffective levels of water fluoride.

Today, I am going to provide the knowledge to assist you in the intelligent practice of water fluoride monitoring. My objectives for the next 30 minutes are:

1. Identify the four major Army Publications that address fluoridation.
2. Name the three primary chemicals used in water fluoridation.
3. Identify the three common methods for monitoring fluoride levels.
4. Explain the possible causes of fluoride loss or gain in community water supplies.
5. Identify the dental professional's responsibility to the consumers of fluoridated water.

My overall goal for this presentation is to strongly suggest to you a more active interface with the activities responsible for assuring and monitoring optimal fluoridation in community water supplies.

### Army Publications on Fluoridation

The first item of business is to share with you the source of our information for water fluoridation. Four Army publications are available to us. These publications outline and specify the techniques, procedures, and standards for activities concentrating on water fluoridation. These publications are:

AR 40-5, Chapter 5, entitled "Environmental Quality."

TB MED 5, entitled "Preventive Dentistry."

TB MED 29, entitled "Sanitary Control and Surveillance of Water Supplies at Fixed and Field Installations."

TB MED 576, entitled "Sanitary Control and Surveillance of Water Supplies at Fixed Installations."

Currently in the works is a new TB MED which will address control and surveillance at field installations, and, in combination with TB MED 576, will replace TB MED 229. The exact date of availability of the new publication is not known at this time.

AR 40-5, Chapter 5, advocates fluoridation of water supplies when optimal levels are not present naturally. TB MED 5 states the known fact of the effectiveness of fluoridation of community water supplies and its relationship in the reduction of dental caries. The main thrust of this technical bulletin is to once again emphasize the role of water fluoridation as the primary, practical means of providing community-wide caries reduction. These two publications tell us why we need to provide fluoridation for our consumers.

TB MED 229 and 576 get into the "hows" of water fluoridation to include such items as:

- Standards of Fluoridation Treatment
- Procedures for Sampling Techniques
- American Water Works Association Standards for Water Quality
- Surveillance
- Quality Control

These are your guides, your foundations for learning and knowing the responsibilities for water fluoridation.

#### Chemicals

Before we progress further, let's review momentarily what it is we are talking about, namely the fluoride chemicals themselves. Much is known about the chemical compounds used in fluoridation. The commonly held belief that one fluoride compound may be more effective than another has been proven erroneous. All have equal effectiveness. One compound may be used

over another simply for economic or availability reasons. Theoretically, any compound which forms fluoride ions in water can be used for adjusting upward the fluoride content of the water supply.

The first fluoride compound used in controlled fluoridation was sodium fluoride. It is available in purities ranging from 90 to over 98 percent. Once fluoridation became an established practice, other compounds came into use, but sodium fluoride, because of its cost, availability and ease of use, is still one of the most popular chemicals.

Sodium Silicofluoride is the most widely used of the fluoride compounds simply because it is the cheapest to use. At a greater than 98 percent purity, and, most importantly, a 35 to 45 percent difference in cents per pound of available fluoride over other compounds, sodium silicofluoride is the choice of many water treatment facilities. Phosphate fertilizer manufacturing provides not only the hydrofluosilicic acid compounds, but is also responsible for the tremendous fluctuation of price and availability of this product. Purity is lower, somewhere around 30 percent. It is a liquid, predominantly water, which requires more expensive storage and transportation. In the recent past, "silly acid" as it is sometimes called, was in short supply due to decreased fertilizer production. The pricing has varied according to the production process, the shipping cost, and storage requirements.

### Monitoring

Our scenario is set: we have the chemicals, the technical data for fluoridation and a water treatment plant; what now? Several factors must be considered. The chemical purity of fluoride compounds does not, in and of itself, produce our magic numbers at the water distribution points. All of our professional literature points to the one part of fluoride per million parts of water as the standard, the optimum, the required for effective fluoridation. But, why do we see figures such as these in Figure 1 from samples taken from Fort Meade, Maryland? The graph shows fluoride readings over a six month period at two distribution sites. Fluctuations like these are not an uncommon occurrence. In a recent HSC survey of 35 fluoride level reports from 36 different HSC installations over a 6 month period in 1982, 26% reported consistently unacceptable levels of fluoride in community water supplies. Why?

It is not my purpose to make you fluoride engineers or American Water Works Association members. I, therefore, will

not dwell on systems analysis in describing the problems inherent in fluoride feeding, pumping and flow. I am, however, going to address the question of varying fluoride concentrations by drawing your attention to our responsibilities as dental professionals to accurately monitor fluoride levels.

A working knowledge of why fluoride levels fluctuate is necessary. A commonly held belief by many dental health professionals is that fluoride loss is the easiest to explain. An erroneous theory is that the activity of fluoride with other chemicals in the water and the accumulation of fluoride on the interior of water pipes explains the predominant loss of fluoride from community water supplies.

Trace amounts of fluoride have been reported in the encrustations of water mains, but never has the amount found been so great as to cause a significant decrease in fluoride levels. Fluoride investigators have found conclusively that the deposition of fluoride is so gradual that even the best analytical measures cannot detect it. It has, in fact, been shown that for significant fluoride loss to occur by interaction with rusty pipes, the encrustations and sludge formation would have to be so great that the water would not be potable.

Interaction of fluoride with other chemicals in the water has also been proven to be an inaccurate rationale for fluoride loss. Unlike chlorine, with which fluoride is often confused, fluoride does not have the ability to be dissipated by organic materials. Once proper measurements, mixing, and introduction of fluoride has taken place, subsequent loss to other chemicals in the water does not occur. In other words, the fluoride added to water can be fully accounted for by accurate analysis at any time along the path of fluoridated water movement. So, neither long pipes, rusty pipes, nor chemicals in the water will affect significantly the average fluoride content in water distribution systems.

Some of the whys of fluoride fluctuation, especially the loss of fluoride, can be more accurately explained by the investigations of Mr. Thomas Reeves, fluoridation Engineer for the Centers for Disease Control in Atlanta, Georgia. Mr. Reeves has suggested that the loss of fluoride is not chemical in nature, but often due to an intrusion of unfluoridated water into the system. Outside water sources such as wells, elevated water towers, connections to another water system, or storage reservoirs, may be culprits in the dilution of accurately fluoridated water. The number of intrusions is especially important as the varying amounts of unfluoridated water will measurably lower the fluoride concentrations.

High fluoride readings can be similarly explained, the difference being that the mix is with water having higher than one part per million fluoride concentration. Another possible cause for high readings may be the failure to take into account the natural fluoride level of the water being fluoridated at the plant. There are many considerations in a complex web of interactions in the fluoridation process.

What does this information suggest? That we are not as knowledgeable about fluoride in water supplies as we say we are? Our supplies of fluoride in water to consumers must be accurately controlled and monitored--for highs, lows, interruptions, or other problems which might prevent the optimal concentration from being delivered to the public.

On the basis of epidemiological evidence, shown in a study of long term monitoring of water fluoridation in a West German community, it was shown that a change in caries prevalence, from an initial reduction to a rise and then to a further reduction was directly linked to the level of water fluoridation. It was also shown that temporary interruptions, reduced levels of fluoridation, or a complete shutdown of the fluoridation system led to a partial or complete elimination of the caries inhibitory effect.

Thomas Reeves has stated that when fluoride supplies run short, utilities must fluoridate at the optimal level for as long as their chemicals last. Lowering the dosage to conserve the supplies reduces the benefits in a geometric relationship; a 20% reduction in fluoride concentration results in a 50% drop in the benefits of fluoridation.

The mere installation of equipment for fluoridation does not insure prevention of tooth decay. Continual surveillance is required to be certain that the targeted level of fluoride is regularly distributed.

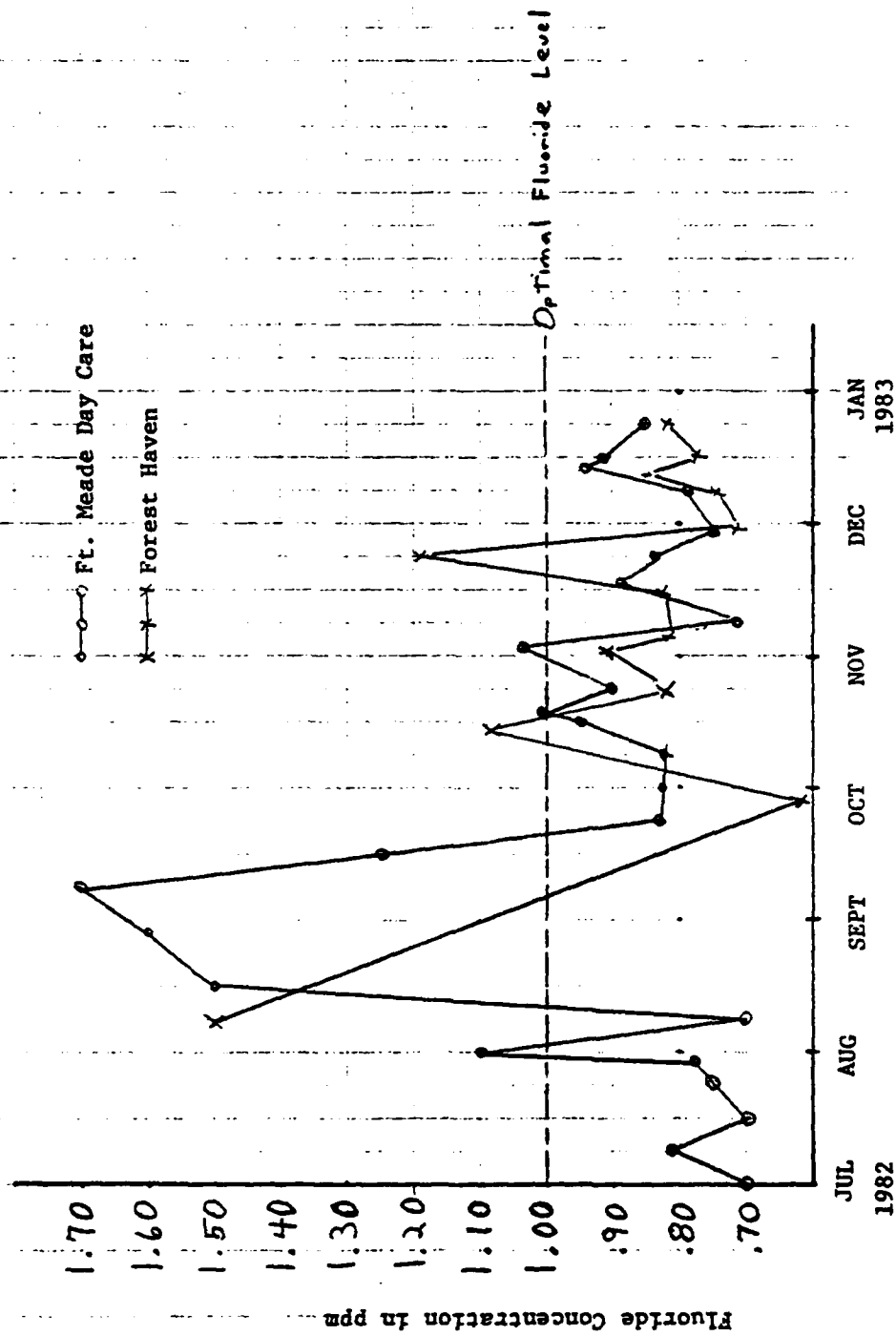
### Conclusion

Who is to take control of this surveillance? Is it enough to rely on our water treatment and preventive medicine personnel? No! I believe that the dental professional has the responsibility to at least be more active in the monitoring process. (1) Get to know water plant engineers and operators. Get to know your preventive medicine personnel responsible for monitoring fluoride levels at your installation. They hold the key. (2) Demand consistent, ongoing reports that are reflections of monitoring activity. Reports are necessary not only from preventive medicine activities, but also from facilities engineers who prepare daily logs of fluoride levels. Comparisons of data from these two sources may surprise you.

I have presented today a short synopsis of fluoridation monitoring problems in community water supplies. There is much more to learn, to share, and to use. Our work demands accurate information and diligence to our ideal of preventive dental care. Only by the involvement that I have described to you today will we assure the potential outcome we all desire.



FIGURE 1. Sample Fluoride Levels from Ft. Meade



## APPENDIX

- Supplemental Fluoride Dosage Schedule
- CDC Fluoridation Course
- Water Fluoridation Reference List

### Supplemental Fluoride Dosage Schedule \*

(In mg. of fluoride per day)

Age of child	Parts per million of fluoride in water supply		
	Less than 0.3	0.3 to 0.7	Greater than 0.7
Birth to 2 yrs.	0.25	0	0
2 to 3 yrs.	0.50	0.25	0
3 to 14 yrs. +	1.00	0.50	0

\* Recommended by the Council on Dental Therapeutics of the American Dental Association and by the Committee on Nutrition of the American Academy of Pediatrics.

+ The American Academy of Pediatrics recommends providing tablets through at least age 15.

DENTAL DISEASE PREVENTION ACTIVITY  
CENTER FOR PREVENTION SERVICES  
CENTERS FOR DISEASE CONTROL

Fluoridation Engineering Course

The Dental Disease Prevention Activity (DDPA) of the Centers for Disease Control (CDC) and the State of Tennessee has a training course on the engineering aspects of community water fluoridation. The course has been designed primarily for State-employed engineers and/or technicians who are involved with community or school water fluoridation. However, other personnel; i.e., State, county, and local dental directors, fluoridation program managers, and others involved in fluoridation program would benefit greatly from attendance at the course.

The 5-day course provides training in a variety of areas, including:

- Fluoridation and public health
- Water fluoridation practices
- Fluoride chemicals
- Fluoridation installation and operation
- Design of fluoridation systems
- School fluoridation
- Fluoride equipment and chemical costs
- Fluoridation systems--calculations and monitoring of fluoride levels

The course contains both didactic and laboratory hands-on training, utilizing lectures, group discussions, and audiovisual aids.

The course is scheduled at various times during the year. There is no registration fee. The next scheduled offering is October 18-22, 1982. It will be conducted at the Tennessee State Department of Health's Operator Training School in Murfreesboro, Tennessee, which is located 35 miles east of Nashville.

For additional information, contact Mr. Thomas G. Reeves, P.E., Fluoridation Engineer, Dental Disease Prevention Activity, Room E-110, Center for Prevention Services, Centers for Disease Control, Atlanta, Georgia 30333, (404) 262-6510.

## WATER FLUORIDATION

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NEW ARMY DENTAL HYGIENE TRAINING

by

COLONEL WILLIAM F. BOWLES III

SYNOPSIS OF PRESENTATION  
TO  
PREVENTIVE DENTISTRY CONFERENCE

1. History of 44/48 week Dental Hygienist Course.
  - a. Conception
  - b. Development
  - c. Accreditation
2. Reasons for cancellation of course.
  - a. Small number of applicants
  - b. Inability to fill Hygiene requirements
3. Proposed new Dental Hygienist Course.
  - a. Course duration 16 weeks - would produce ASI X2
  - b. Course would include expanded functions
  - c. Hygienists would not be trained to the same level of skill as previous personnel
4. Holdup of projected course start - funding.
5. Possible start date - October - January FY84.